



Eat Your Greens with Dr. Black | plant-based nutrition for the whole family

Fabulous Fiber: Unlocking the Benefits of a High-Fiber Diet

Welcome to Eat Your Greens with Dr. Black, where we discuss plant-based nutrition for the whole family. This podcast is all about supporting families in their efforts to give their children a solid foundation of healthy eating habits that will last a lifetime. I'm your host, Dr. Amy Brown. Dr. Angela Black.

I'm a board-certified pediatrician with over 20 years of experience. Over the course of my career, I've witnessed the rise of issues like high blood pressure, type 2 diabetes, and even fatty liver disease in kids as young as 10. I'm passionate about using evidence-based guidelines to teach my patients and their parents how to prevent chronic diseases for a lifetime of health.

I hope you find this podcast to be informative. And empowering for more episodes or if you would like more information about child nutrition and feeding, please visit www.eatgreenswithdrblack.com.

That was one of my little patients talking about what kinds of fruit she likes. Apparently, she really likes oranges. Today, I'm going to talk about fabulous fiber. So, I thought I might start off by telling a few really bad bean jokes. Don't hate me. Here goes.

Did you hear about the bean who changed careers?
He went into a different field.

What do you call onions and beans? Tear gas. Ha ha. Okay, one more.

What kind of shows do beans do? Podcasts! Ha ha!

Welcome to the Eat Your Greens with Dr. Black podcast. Today, I'll call it the Eat Your Beans with Dr. Black podcast. Okay, so now that I've lost half my listeners, let's get on with the episode.

Please be aware that this podcast provides general health information about nutrition and feeding of infants and children and is meant for educational purposes only. It's not intended to replace the important relationship between a parent, child, and pediatrician. If you have concerns about your child's nutrition, health, or growth, please consult your doctor.

Alright, so... fiber. You've heard people talk about it lots, maybe your doctor even told you you should eat more foods with fiber in them, but what is it really? Basically, it's a complex carbohydrate, a bunch of complex carbohydrate molecules all linked together.

So, yes, that's right, I said Carbohydrate - it's true, not all carbs are bad. Fiber is found in the cell wall of plant cells. So, it's not found in animals, only plants, and it's not digested. When you eat foods with fiber, that part of the food passes from your



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mouth all the way out to the other end, basically intact. But it does a whole lot of stuff along the way.

Because there are so many different types of plants, it follows that there are thousands of distinct types of fiber. But basically, we can break them down into two main categories, soluble and insoluble. Soluble, as the name implies, Dissolves in water. It forms a gel, and it can help lower your cholesterol, regulate your blood sugar, and it does a whole lot of other things. Insoluble fiber does not dissolve in water, and it helps with constipation, among other things.

Basically, there are many, many benefits of fiber, and we're going to talk a lot about that in this episode. The usual recommendation is for people to get somewhere between 25 to 30 grams of dietary fiber. Uh, that is the minimum recommendation. And most of us, especially in the West, get way less than that. In fact, we get closer to 15 grams a day, about half of that minimum recommended daily amount.

Okay, so before I start actually discussing the various benefits of eating more fiber rich foods, I'm just going to read an excerpt from a 2019 study that was published in the Lancet Journal. This study was a Systematic Review and Meta Analysis. And what that means is that the scientists looked at a large number of studies that have been done and tried to determine how strong the existing evidence is. And then they reported their results. So, in the study they stated, that observational data suggest a 15 to 30 percent decrease in all cause and cardiovascular related mortality, and incidence of coronary heart disease, stroke incidence, and mortality, Type 2 diabetes and colorectal cancer when comparing the highest dietary fiber consumers with the lowest consumers. So, to paraphrase, people who ate the most fiber had a 15 to 30 percent decrease in disease or death, uh, related to cardiovascular disease, stroke, type two diabetes, and colorectal cancer.

So, they went on to say that clinical trials show significantly lower body weight, systolic blood pressure, and total cholesterol when comparing higher with lower intakes of dietary fiber. Risk reduction associated with a range of critical outcomes was greatest when daily intake of dietary fiber was between 25 and 29 grams, and this occurred in a dose dependent manner.

So, the more fiber you ate, the greater the benefits. So now you know why I'm dedicating an entire episode just to fiber. We know that the benefits to your health are really much greater than was once believed. So, I'm going to start just going through some of the benefits and talking a little bit about each one of them in turn.

So, let's start with the most obvious one, the one that you already know, probably the thing that you think is the only benefit to eating more fiber in your diet, and that's reducing or treating constipation, right? Fiber keeps you regular. We all know this; it's not a secret. For this one, I'm not going to go into a lot of detail in about two weeks. If you listen to episode number 10, I'm going to do an episode dedicated exclusively to preventing and treating constipation. But basically, that insoluble fiber that I already



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talked about - the one that doesn't dissolve in water - you get that from whole grains, cereals, vegetables, legumes, things like that.

This increases the bulk of your stool. So, it makes it a little bit bigger, and a bulky stool is easier to pass. We all know this. You know, those little, tiny deer pellets, those little pebbles, they're hard to pass. You have to strain, they're painful. So, the, uh, a bigger bulkier stool is better for you.

So, the other thing that insoluble fiber does is soften the stool. It does this by pulling water into it. So that's why it's important to drink plenty of water to help the fiber do its job better.

There are a number of reasons besides just making it easier to go to the bathroom that you should try to prevent constipation. For example, you can reduce your risk of hemorrhoids and anal fissures. Nobody wants those. You can also reduce your risk of urinary tract infections. And something we see often in pediatrics is bedwetting. Bedwetting is much more common in children who are constipated. So, when they go see a specialist, the first thing they're going to tell them to help prevent bedwetting is make sure your kid is not constipated. Feed them lots of fruits and vegetables and oats and grains.

On the other hand, the opposite can also be true. The soluble fiber, the fiber that dissolves in water, can help relieve diarrhea. You're going to get that soluble fiber in things like apples and oats, legumes, and psyllium. And it does this by slowing the transit time. It takes longer for the poop to get through the colon. This gives the body more time to reabsorb that water, and that helps to relieve the diarrhea.

Alright, so let's talk a little bit more about the gut while we're talking about constipation and diarrhea. Let's, let's just stay in the colon for a little while. So, fiber has both a direct and indirect effect on the intestinal epithelium. So, the epithelium are the cells lining the intestines, and there's only one thin little layer of these cells between your intestines and the inside of your body. It's the only thing keeping all those toxins and the disease-causing bacteria, things like that, from getting into your bloodstream. So, it's really critical to keep these epithelial cells healthy, and fiber can help you do that.

Eating more fiber rich foods can help relieve the symptoms of a variety of intestinal disorders. So, for instance, irritable bowel syndrome. The symptoms of irritable bowel syndrome include debilitating abdominal pain, bloating, an urgent need to use the bathroom, and constipation, diarrhea, or sometimes both, alternating.

IBS patients who work with their doctor to gradually increase the amount and variety of the fiber rich foods in their diet, often experience improvement in these symptoms and their quality of life. But it does need to be said, this needs to be done slowly. If you go too fast, it's actually going to make those IBS symptoms worse. So, if you have IBS, work with a doctor who knows how to treat your symptoms.

Another common disorder of the gut, especially in older people, is diverticulitis. So, people who eat a low fiber diet are at a higher risk of developing diverticula. These are



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small bulges in the wall of the colon that can become painfully inflamed. Once they're inflamed, you have to eat a low fiber diet. The fiber-y foods can get trapped in those diverticula and make the problem worse. But if you eat a fiber rich diet when you're young, you're much less likely to develop the problem in the first place.

So, moving out of the gut into the rest of the body, one really important thing that fiber does is lower our cholesterol. Soluble fiber: I mentioned some of the foods that you can find it in earlier, but also things like avocado. yum, guacamole anyone? Sweet potatoes, oats, peas, beans, broccoli. The fiber in these foods can bind cholesterol in the small intestine and that prevents it from being absorbed into the bloodstream. So, when we have high levels of cholesterol in our blood, it gets deposited into the walls of our blood vessels and this causes vascular disease.

Examples of vascular disease would be heart disease when it's deposited into the walls of the coronary arteries. Those are the arteries that supply blood to the heart muscle and when they're blocked off and blood flow can't get to the heart muscle, you have a heart attack. So, lowering your cholesterol is going to prevent cardiovascular disease. Other complications of vascular disease include stroke and erectile dysfunction. So, lowering your blood cholesterol level. by eating a fiber rich diet is going to help prevent these diseases.

Another huge benefit to eating a fiber rich diet is that it helps regulate your blood sugar and can prevent or help reduce the severity of diabetes. So, diabetes, as you may know, is when the level of sugar in your blood is too high. You need your blood sugar to be in a very narrow range. If it's too low, that's dangerous. If it's too high, it acts like a poison in our body and destroys a lot of things. So according to studies, individuals who regularly consume soluble fiber, foods with soluble fiber, were found to have a lower hemoglobin A1c, and that's a marker of blood sugar control. So even though fiber is a carbohydrate, like I said earlier, it's not digested. So, it doesn't contribute to your blood sugar level like other types of carbs, like starch and sugar. So, if you're filling up your plate with these fiber rich grains, veggies, and legumes, you're less likely to be eating tons of food with refined flour and sugar which are going to make your blood sugar spike.

Another thing that the dietary fiber does is to help slow down your digestion. This is another way that it keeps your blood sugar from spiking up too fast and can help regulate your blood sugar and prevent diabetes.

Next, let's talk about cancer. There's very strong scientific evidence that increasing fiber intake lowers the risk of several of the deadliest types of cancer, including breast cancer, pancreatic cancer, prostate, colorectal, stomach, and endometrial cancer, among others. So, the mechanisms that underlie this reduction in cancer rates in people who consume more fiber rich foods are really still being sorted out, and of course, they vary based on the type of cancer.



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Let's just talk about a few. So, in the case of colorectal cancer, some of the theories of how fiber can reduce your risk for this cancer include the effect of fiber on the microbiome, and we're going to talk more about that later in the episode.

Also, slowing the stool transit time and how it binds bile acids. So, these are some of the ways that it's thought that fiber can prevent colorectal cancer.

For breast and endometrial cancer, fiber can decrease circulating estrogen concentrations, and for especially postmenopausal women, higher estrogen levels are associated with increased risks for breast and endometrial cancer.

So, I would like to point out That the phytoestrogens found in soy milk and other soy products actually protect against breast cancer by several mechanisms. So, don't believe the hype about estrogen in soy being bad for you.

And then for pancreatic cancer, um, there are a few theories about how Increased fiber in the diet might reduce your risk for pancreatic cancer. Of course, uh, you may know pancreatic cancer is one of the most deadly types of cancer. So, the pancreas is an organ that lives right behind your stomach and its job is to secrete a lot of different enzymes and other molecules that help us digest our food, but it also secretes insulin. Insulin is the hormone that helps us take sugar out of our blood and put it into the cells where we use it. So, insulin regulates our blood sugar levels. So, the reduced risk of diabetes that goes along with a fiber rich diet may be one of the factors that helps reduce diabetes. It is recognized that people with diabetes have higher rates of pancreatic and other cancers. Also, fibers influence on insulin resistance pathways. Fiber helps to reduce insulin resistance so it can work more effectively, and this may in turn reduce your risk for pancreatic cancer. Last, fiber may have an effect on the expression of several genes that are involved in pancreatic inflammation.

There's still lots to be learned about how our diet modifies our risks for lots of different types of cancers. But the evidence to support the reduced risk of those specific types of cancers, again, that was breast, pancreatic, prostate, colorectal, stomach, and endometrial cancer, uh, specifically those cancer risks, the evidence is very strong that eating plant-based foods rich in fiber can reduce your risk for those cancers.

Okay, moving on to one that's very popular, lots of people want to hear about, and that's that eating a fiber rich diet can help you maintain a healthy weight. So, fiber rich foods, which as we said before, only come from plants, tend to be high in nutrients but very low in calories. So, this means that you can eat more of them than say some empty calorie junk foods without risking gaining unwanted weight.

At the same time, the fiber in your food helps you feel full faster, so you're not as likely to binge. I mean, how many times in your life have you been unable to stop yourself from eating an entire bag of broccoli florets compared to, say, the entire bag of potato chips? I don't know about you, but I've never actually tried to binge eat a bag of broccoli florets.



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As I mentioned earlier, fiber foods can slow that gastric emptying and the intestinal transit times and that means that the food you eat stays with you longer so you're not hungry again quite as soon as you might be, say, with a lower fiber meal that's digested quickly and leaves you feeling empty. And last, it bears repeating, when you choose to eat fresh fruits, vegetables, grains and legumes, you're also making a choice not to eat high fat, high calorie, or refined, processed, and sugary foods, which are all universally associated with excess weight gain.

Another really important benefit derived from eating fiber rich foods is improved immune system function. And boy, I'll tell you, since the pandemic started, I think we're all really keen to have our immune systems working as well as possible, right? So, it's well understood that fruits and vegetables, things like that, have tons of vitamins and phytonutrients that help us fight off illness and recover more quickly when we do catch something. But the fiber in plant-based foods specifically helps our immune system in a number of ways. First of all, it's been estimated that 60 to 80 percent of the cells of our immune system reside in our gut. Mostly, they are in something called gut associated lymphoid tissues. So, keeping our gut healthy has a direct effect on how well our immune system functions.

By keeping that thin layer of gut epithelial cells healthy and tightly joined together, fiber helps to prevent leaky gut. This is where pathogens and toxins leak out of the intestine into the bloodstream. And some of these invading molecules look a lot like the proteins on our own cells. And then our immune system may have a hard time telling the difference between these molecules, endotoxin and our own cells. So, it attacks them. And this is the cause of autoimmune diseases.

Okay, let's talk about the last big benefit of fiber. And this, this is a big one. In fact, it's so big, I'm going to do a separate episode all about this topic. And that is the gut microbiome. I mean, to be honest, I could do probably like 10 episodes or like a whole podcast show, a whole podcast series just on the microbiome.

But, you know, I, I have a degree - my bachelor's degree is in microbiology. So, I'll admit I, I tend to nerd out over single celled organisms. So, I think this is, this stuff is so interesting and cool. The gut microbiome, also called microbiota, and there's a subtle difference between those two words, but they're used interchangeably, so I'm just going to say gut microbiome, but it's made up of 39 trillion trillion microbes that live in your colon, mostly bacteria, but also other things like viruses and fungi, mostly bacteria. 39 trillion. That's way more than the number of cells in your entire body. So, some people have estimated that as few as 10 to 20 percent of the cells in your body are human, and the rest are other things, mostly bacteria. So, you think you're walking around just this like, you know, walking, talking, thinking, human being, but I'm here to tell you, you are really just a complex bag of microbes walking around. And they're in control and I, I sort of only halfway mean that jokingly because those microbes are so important, and they control so many things.



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They affect so many things in our body. It's really important to have a lot of different types of the good kinds of bacteria in your colon. And when you have a nice, healthy, diverse population of these bacteria, they're going to help to crowd out the bad ones that cause disease.

So, these healthy bacteria in our colon make the enzymes needed to digest a lot of our food. In fact, most of our digestion is not done by us directly, it's done by our bacteria. We couldn't extract a lot of the nutrition from our food. Without these bacteria and one of the things that they do is to ferment the fiber in our foods. They metabolize and process the fiber that we eat in these plant-based foods. We don't make the enzymes to do that. We can't process the fiber in the food that we eat on our own. We need our gut bacteria to do it for us.

These bacteria, these healthy, diverse bacteria, then release a group of molecules called short chain fatty acids and these do a number of miraculous things for our overall health. Again, more on this in the, in the episode specifically about the microbiome, but here's a list of just a few of the things they do. So, actually, it's the short chain fatty acids that keep the lining, the epithelium of your gut healthy and intact so that those disease-causing germs and substances like endotoxins don't get into your bloodstream. They also participate in lowering your cholesterol by having direct control over an enzyme that's crucial for cholesterol formation. So, when you have short chain fatty acids in your system, you don't even make as much cholesterol. So, the fiber helps to block the absorption of it, and then when it supports your gut microbiome, you make these short chain fatty acids, and that even further lowers your cholesterol level.

Short chain fatty acids also help keep the immune system working properly to fight off infection and they can help prevent the immune system from overreacting and that's going to cause those autoimmune diseases or allergic diseases. The evidence about this is still being debated, it's still in development, they're still looking at this, but there is evidence to suggest that things like eczema and asthma can be reduced by eating a whole food plant-based diet, probably because of the way that those foods support your gut microbiome and the production of these anti-inflammatory short chain fatty acids.

So, another effect of the short chain fatty acids is cancer prevention. So, our cells have a natural lifespan just like anything else. They go through their life and then at some point it's time for them to die off. When they don't die off appropriately, that's when you get cancer. They start multiplying without stopping and you get a tumor. So short chain fatty acids can actually help cells die when their time is up, when it's the right time for them to die. And thereby that's one of the mechanisms that helps prevent cancer.

These short chain fatty acids also help promote the release of hormones that make you feel full after a meal (that's called satiety) - satiety promoting hormones. And this is going to help you maintain a healthy weight.

And then finally, they can act as messengers in the gut brain axis. The gut brain axis is a communication highway between our intestines and our brain and the short chain fatty



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acids act as the messengers and they can improve our ability to do things like think clearly (that's cognition), they improve memory, they can reduce your risk for Alzheimer's and Parkinson's disease, and they can even help prevent depression and anxiety. The ways that they do this are still being determined. Scientists are still studying it. A lot of it probably relates to the anti-inflammatory effects of short chain fatty acids. We're still learning about it. There's clear evidence that having a healthy gut microbiome releases these short chain fatty acids and then they go off... they can even cross over into your brain and affect the way you think and feel and your memory.

So, you know, it's obvious that many of the benefits of the high fiber diet that I discussed earlier in the episode are not directly due to fiber but are from the effects of higher levels of short chain fatty acids secreted by a healthy, diverse microbiome.

On the other hand, eating a lot of processed foods, especially processed meat like bacon, hot dogs, and sausage, damages the healthy bacteria and it promotes unhealthy species of bacteria. These unhealthy bacteria secrete other chemicals that are pro-inflammatory, and they can raise your cholesterol. They raise your cardiovascular disease risk, your risk of diabetes, and they can increase your cancer risk.

So, it's not just about eating more fiber rich foods. It's also important to reduce your consumption of those processed foods, and especially processed meat.

Another way we can damage our microbiome is by overusing antibiotics. So, you know, antibiotics are the medicines that we use to fight off bacterial illness. They only kill bacteria. They don't have an effect on fungus or viruses, things like that. So unfortunately, if you want to kill off the bad bacteria that are causing your infection with antibiotics, you're also going to inadvertently kill off some of the good bacteria. So, we really want to limit the use of antibiotics to when it's really needed for a documented, proven, serious bacterial illness. So, if you're a patient in our group and you have an appointment with me, if you come to see me expecting to get an antibiotic prescription for your flu or your cold or your COVID, you're going to be disappointed. I try really hard not to prescribe antibiotics unless I absolutely have to.

So, the importance of supporting a healthy microbiome really just cannot be overstated and the best way to ensure that you have a healthy and diverse population of gut bacteria is to eat a wide variety of plants that contain all those different types of fiber. The American Gut Study (and I'll put a link in the show notes to this) but the American Gut Study showed that eating 30 plant-based foods per week was associated with the highest levels of gut microbial diversity.

30 sounds like a lot, but fortunately, with a little planning, it's actually easier than it sounds to eat 30 different plant-based foods per week. Think about having a smoothie for breakfast with a couple different types of fruit and a green and maybe some kind of oats or some kind of grain. And if you have a salad for lunch with some tomatoes and carrots and cucumbers. And then when you have dinner, you have a couple of sides of vegetables and maybe some fresh fruit, uh, for dessert.



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I mean, you've probably already gotten 10 to 15 different, uh, different types of plants just in one day. So, 30 a week sounds like a lot, but it's really not. It's totally doable.

Fiber is also called a prebiotic. So, the bacteria is the probiotic, and the fiber is the prebiotic. It feeds and supports those probiotic bacteria. You could go to the store and spend hundreds of dollars on probiotic supplements, and it's not going to do you any good at all if you're not feeding and supporting those bacteria.

So, here's what I tell my patients in the office. You have to imagine that you have a turtle living inside your gut, inside your intestines. (So, shout out to my sister-in-law, Debbie. She loves turtles. She has several Russian tortoises. Hi, Debbie!) Anyway, so I tell my patients, you have a turtle in your gut. Turtles like to eat lots of fresh leafy greens and other fruits and vegetables. And so, you want to take care of your turtle. Give it lots of fresh vegetables and keep it healthy.

All right, so after listening to this episode, you may be tempted to rush out to the store, fill your cart with tons of beans and salad and fruits, and then come home and sit down to a huge dinner with 50 grams of fiber. But I do want to ensure that this podcast is balanced. So, let's talk about some of the reasons why you might not want to do that. And when might someone not want to eat a high fiber diet? This is going to be a really short list.

First off, I don't have to tell you about the main negative side of eating fiber rich foods, right? Overzealous fiber consumption can sometimes lead to stomach cramps and bloating. So, like every good thing, moderation is key.

So let me tell you a funny story. When my oldest daughter was maybe two and a half or three, she farted - she passed gas - and she surprised herself. She was shocked by this, and she said, "Oh! My hiney burped!" So, now in our family (she's now in her 20s. This was 20 years ago) to this day we still call farts hiney burps, and personally, I think everybody should call them that. Hiney burps! It's the best name.

So yes, gas, farting, hiney burps, whatever you want to call it: common side effect of eating fiber rich foods, especially if you ramp it up too fast. Fortunately, most people can reduce this uncomfortable and smelly side effect, the bloating and the gas, by increasing their fiber intake gradually. And this allows the gut bacteria to adapt and change so that they're better able to process that fiber and you have less discomfort. So, take it easy. Don't rush out and buy, you know, a 10-pound bag of beans and try to eat it all at once. You will regret it.

Also, remember, if you don't drink enough water with your fiber rich foods, you can actually become constipated. So, don't forget to drink lots of water.

The only other reason, really, why your doctor might advise you to eat a lower fiber diet is going to be if you have active Crohn's disease, ulcerative colitis, or diverticulitis, or if you have a lot of IBS symptoms. Although, I think IBS - this really can be improved by a



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high fiber diet. Again, you just have to take it slow. But if you have active Crohn's, ulcerative colitis, or diverticulitis, your doctor's probably going to tell you to take it easy on the fiber and eat a low fiber diet.

Other than that, everybody else, really, the health benefits of eating a wide variety of fiber rich foods far outweigh the disadvantages and really cannot be emphasized enough, how beneficial to your health this diet will be.

So, if you want to learn more about the benefits of fiber, I can't recommend enough a book called *The Fiber Fueled Gut*. It was written by a gastroenterologist, Dr. Will Bulsiewicz, and I'll put a link to the book in the show notes. This is not a sponsored episode or podcast. Uh, it's definitely that... the author is definitely someone I would love to interview one day. I don't know if my podcast will ever be well known enough to be able to swing somebody like this guy, he's pretty famous. And, um... but it's an excellent book; really lays out the benefits of eating, um, a fiber rich diet, goes into way more detail about how it acts on your gut microbiome, he even includes a stepwise plan for how to gradually increase the fiber in your diet so that you can minimize those side effects. And if you suffer from any kind of like chronic abdominal pain or, uh, other like gut issues and some food intolerances, he lays out a nice plan for out how to overcome that. So, it's really 100 percent worth checking out.

All right, well that's it for this episode all about fiber. I hope you have learned a lot. I hope you're going to try to increase more of these foods in your diet. And thank you for listening. Don't forget to eat your greens.

Thanks for listening to this episode of *Eat Your Greens with Dr. Black*. Parenting is a journey that comes with many challenges, but also much joy. I hope this podcast empowers you to set your family on the path to lifelong health. If you enjoyed this podcast, please hit the subscribe button so you never miss an episode.

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