Dr. David Williams
Alternatives®
For the Health Conscious Individual
VOLUME 21 • No. 5 • MAY 2018

Give Your Gut a Diet Makeover

Balance is a universal law. Living a balanced life is essential to happiness, success, and well-being, and it is one of the basic tenets of every religion and form of health care. Change is one of the few constants in life, and balance provides the counteracting force that allows us to remain steady during change.

Dr. David Williams

Whether we are trying to optimize our health, restore it, or simply maintain it, we ultimately must achieve a balance of the physical, chemical, structural, and spiritual realms. On a microscopic level, nowhere is this more apparent than within our microbiome.

Science is finally just beginning to understand the profound health ramifications associated with the specific microorganisms that live on and in the body. And it's becoming more and more clear that these microorganisms must be in balance for the body to remain healthy.

The recent flood of studies into the human microbiome has opened up Pandora's box for the pharmaceutical industry. As the research begins to reveal which strains of bacteria and other microorganisms influence weight, mental state, blood sugar, and other factors, it also calls into question the effects various drugs have on these organisms.

It's already been shown how antibiotic use can lead to obesity through the destruction of certain beneficial bacteria. And after the eradication of stomach bacteria with antibiotics and proton pump inhibitors, the risk of developing stomach cancer increases by as much as 800 percent. This is just the tip of the iceberg. When (or should I say if) it's ever revealed how drugs disrupt the microbiome and contribute to disease, the pharmaceutical industry will have some serious questions to answer.

For decades, the public was duped into believing that saturated fat and dietary cholesterol caused heart disease. However, studies have now shown that this definitely isn't the case. Even Ancel Keys, the physiologist who came up with the hypothesis that saturated fat caused cardiovascular disease, said the following in 1997: "There's no connection whatsoever between and cholesterol in food and cholesterol in blood. And we've known that all along. Cholesterol in the diet doesn't matter at all unless you happen to be a chicken or a rabbit."

So saturated fats and cholesterol have been exonerated when it comes to heart disease—but you wouldn't know this from watching the news or reading any announcements from government health authorities. In fact, prescriptions for cholesterol-lowering statin drugs are still being handed out like candy. And insurance companies continue to pay for these drugs as if they actually saved lives...which the research shows they don't.

The public has never been given any logical explanation as to what could be causing the heart disease pandemic. But the closer you look at the research, the more apparent it becomes that a disruption in the microbiome could be one of the major underlying factors.

The Gum-Heart Link

Long before the cholesterol hoax gained traction, the dental community observed that patients with periodontal (gum) disease tended to also have a higher incidence of heart disease. There were even a few studies that supported this theory.

The idea was that pathogenic bacteria from the mouth could

enter the bloodstream, set up house in the heart/arteries, and initiate an inflammatory reaction, eventually resulting in clogging of the arteries and heart attack. I believe this is still a valid explanation.

In fact, 24 years ago in this very newsletter, I wrote about the work of two dentists, Dr. Weston Price and Dr. George Meinig.

In the early 1900s, Dr. Price did extensive work proving how dental infections spread throughout the body, causing systemic infections and debilitating degenerative diseases. He published 25 scientific articles and two research volumes containing 1,174 pages of his findings. And when I first met Dr. Meinig, he told me he had uncovered Dr. Price's work and was featuring it in his upcoming book, *Root Canal Cover-Up*.

It should have been a wake-up call for the medical community. But after the cholesterol hoax had taken off, the periodontal connection pretty much fell by the wayside and became a *nontraditional* risk factor for heart disease.

In Western medicine, there's a huge disconnect between oral health and the health of the rest of the body. But understanding the ins and outs of periodontal disease can provide some clues as to why someone would develop cardiovascular disease. More importantly, it provides ways to help prevent it.

When we talk about cardiovascular disease, we're really talking about a disease of the arteries, or arteriosclerosis. This is where the interior walls of the arteries become inflamed and fats (lipids) stick to the walls, forming clogging plaques. The inflammation can originate from compounds in the bloodstream or from bacteria.

The prevailing theory for so long has been that saturated animal fats in the diet form these fatty plaques and cause arteriosclerosis. But researchers at the University of Connecticut recently took samples of the fatty plaques from heart patients and discovered they had a chemical signature totally unlike those that make up animal fats. They obviously were not from saturated fats. In fact, they were found to originate from bacteria called *Bacteroidetes*. (*J Lipid Res 2017 Oct;58(10):1999–2007*)

Bacteroidetes are found in the mouth and gut and are known to cause periodontal disease.

Frank Nichols, a researcher on this study, described *Bacteroidetes* this way: "I always call them greasy bugs because they make so much lipid. They are constantly shedding tiny blebs of lipids. Looks like bunches of grapes..." on a bacterial scale.

It's important to note that the *Bacteroidetes* don't invade the arteries. They typically are happy to stay in the mouth and intestines. It's the lipids they produce that can pass through the cell walls, enter the bloodstream, and travel to the heart and other parts of the body. Bleeding gums provide an easy route directly into the bloodstream. Since the lipids they produce are different from the lipids naturally made by the body, the immune system sees them as foreign compounds and attacks them—which results in inflammation. The fatty byproducts of these bacteria can cause periodontal and cardiovascular diseases.

Bacteroidetes is one of the main categories of bacteria that inhabit the intestinal tract. The other is *Firmicutes*. These two forms make up about 90 percent of the microbiome, with *Bacteroidetes* accounting for roughly half of all bacteria in the gut. The *Firmicutes* include well-known forms like *Lactobacillus*, *Lactococcus*, *Clostridium*, and *Heliobacterium*. The *Bacteroidetes* forms aren't as well known, but they are the ones that ferment indigestible fiber and produce fatty acid, which

Alternatives® **Author: Dr. David Williams; Editor: Larissa Long**

ISSN# 0893-5025. Published monthly for $69.99/yr. by Mountain Home Publishing at 6710-A Rockledge Dr. Ste. 500, Bethesda, MD 20817. Editorial Office: 6710-A Rockledge Dr. Ste. 500, Bethesda, MD 20817. Periodicals postage paid at Bethesda, MD, and at additional mailing offices.

Postmaster: Send address changes to *Alternatives*, PO Box 11, Montoursville, PA 17754.

NEWS TO USE *from around the world*

Cheese Prevents Cardiovascular Problems

SUZHOU, CHINA—Chinese researchers at Soochow University looked at 15 different long-term studies and found that long-term cheese consumption significantly lowers the risk of heart disease and stroke.

Specifically, eating 1.5 ounces of cheese daily was found to reduce the risk of heart disease by 14 percent and the risk of stroke by 10 percent. *(Eur J Nutr 2017 Dec;56(8):2565–75)*

Keep in mind we're talking about real saturated-fat-containing cheese—not the funny loaves of cheese-like substances that can sit on the shelf indefinitely without refrigeration. The conventional medical community probably doesn't know what to do with this information. After all, it provides even more evidence that saturated fats are NOT the cause of cardiovascular disease.

REM Sleep and Dementia

MELBOURNE, AUSTRALIA—Researchers at Swinburne University followed 321 participants in the Framingham Heart Study for about 12 years, evaluating any relationship between their sleep stages and dementia. All participants were over the age of 60. The researchers discovered that there was a connection between the fifth stage of sleep (REM) and dementia risk.

REM stands for Rapid Eye Movement. It is the stage of sleep where the eyes move rapidly, breathing rate, pulse, and body temperature increase, and dreaming occurs.

Individuals who developed dementia spent only 17 percent of their sleep time in REM, compared to 20 percent for those who didn't develop dementia. For every one percent decrease in REM sleep, the risk of dementia increased by 9 percent. *(Neurology 2017 Sep;89(12):1244–50)*

Researchers are still trying to figure out exactly what happens during the different phases of sleep.

We do know that during certain periods, the brain sorts out its "inbox" from the day. It is estimated that for every two hours of new information input, the brain needs one hour to process it. Material is categorized, arranged according to patterns, and either stored or trashed. Eliminating unneeded information prevents the brain from becoming overloaded and allows it to prioritize important material. It is now thought that the brains of PTSD patients can't figure out what information to save, so everything gets stored.

Also, certain hormones are released during specific sleep periods. Roughly 80 percent of human growth hormone is released during sleep. Sleep (or lack thereof) also has a significant impact on the function of the immune system.

Good sleep is so essential to our health, and now we know that a lack of proper sleep is a risk factor for dementia. ▪

supplies about 10 percent of our daily calories. *(J Mol Med 2017 Jan;95(1):1–3)*

Both *Bacteroidetes* and *Firmicutes* are necessary for our health. The key, as I mentioned earlier, is balance. Unfortunately, at this stage of the research, we don't really know what the proper balance of the various gut microbes should be. It's very complicated.

Within each of these families of bacteria there are thousands of members, as well as viruses, fungi, and other organisms that contribute to the microbiome. Furthermore, we have no real historical basis for what constitutes the ideal microbiome. Our ancestral microbiome levels were never measured, and the dietary habits of our modern world are rapidly changing the diets of the

Wild vs. Farm-Raised

Question: I've heard wild salmon contains more mercury than farm raised, so farmed is safer. What are your thoughts? — D.M., White Bear Lake, MN

Answer: Salmon and sardines actually have some of the lowest mercury levels of any fish. (Catfish and crawfish also have extremely low levels.) Furthermore, the kind of mercury found in fish is very hard for humans to assimilate, and typically isn't a problem. As far as nutrition, farmed salmon does have a higher fat content than wild salmon—but it's not omega-3 fats, it's omega-6 fats typically found in vegetable oils. This is problematic because our omega-3 to omega-6 ratio is already out of balance. As a society, we consume far too many omega-6s and don't need more from sources such as fish.

The reason for this is that farmed fish are often fed omega-6-rich products like corn. The same thing has happened to tilapia. The fat content of farm-raised tilapia now resembles that of chicken more than fish.

Eating any salmon is better than eating none, but with wild salmon you'll be getting more of the important anti-inflammatory omega-3 fats.

Finally, don't forget to eat the skin—it's one of the best parts. I grill my salmon with the skin side down. You never have to turn the salmon, and once cooked, the meat just lifts away from the skin, which can then be scraped from the grill and eaten with the thin layer of fat on top...delicious. ■

few primitive societies left on the planet.

Research has shown that individuals with metabolic syndrome, chronic inflammatory intestinal disease, type 2 diabetes, and heart disease have totally different ratios of *Bacteroidetes* and *Firmicutes* than people without those problems. A bacterial imbalance increases appetite and food cravings, and leads to insulin resistance, high blood pressure, and elevated levels of cholesterol and triglycerides—all characteristics of metabolic syndrome and risk factors for cardiovascular disease and heart attack.

Bacteroidetes' fatty byproducts aren't the only factor involved in the development of heart disease, but they could be one of the primary reasons for the dramatic increase we've seen over the last few decades. They might also help explain why many inflammatory diseases that were once only found in the elderly are now showing up in children and young adults.

Like most other systemic diseases, cardiovascular disease has multiple triggers or factors that lead to an inflammatory process... one of the hallmarks of this disease. Our individual environment can have a big influence. Obviously toxic and/or foreign compounds entering the bloodstream from inhaling cigarette smoke, vaping, chemical exposure, water/air pollution, etc., will trigger an inflammatory response. Consuming drugs, rancid or chemically modified fats, and highly refined foods can also elicit an immune response.

Get More Good Bugs

You may remember a past article where I explained that 90 percent of our body consists of bacteria and microorganisms, and only 10 percent are human cells. We are in the minority, and to a far greater extent than anyone imagined, our health and longevity are controlled by these microbes. It gives a whole new meaning to our concept of "self" and who we are as individuals.

Genetically, we have inherited certain non-reversible characteristics from our parents, but the composition of our microbiome is one area where genetics are typically not a factor.

Diet is the major driver of microbiome diversity. If you want to change the types of bacteria in your gut/body, it can be accomplished through your diet. And this is amazing because research has now shown that gut microbes can switch our existing genes on or off. Through the production of short-chain fatty acids (SCFAs) and other compounds,

gut bacteria can directly influence genetic expression throughout the body and change our overall health and well-being. *(Cell Host Microbe 2016 May;19(5):731–43) (Genome Res 2015 Oct;25(10):1558–69)*

At this point, we don't know the best ratio of the various microbes needed to achieve optimal health. And we don't know exactly how much of what foods we'd have to eat to achieve the perfect mix. I doubt we ever will know these things considering every human is biochemically unique and there are so many other variables involved.

With life, everything is constantly changing, and balance allows us to remain steady during the change. The human body has the innate ability to operate efficiently, self-regulate, and repair itself when it is in balance.

One of the best examples of the innate balancing ability of gut microbes, in particular, was illustrated in a study involving a Hutterite community. Hutterites are a North American ethnoreligious group that practice communal living and are geographically and genetically isolated from the outside world. They partake in communal dining and the variation in their food is mainly due to seasonal availability of fresh produce. They have similar microbiomes, but the diversity of their gut bacteria changes from summer to winter.

During the summer months, when plenty of fresh plant foods are available, *Bacteroidetes*, which are most efficient at breaking down fiber, flourish. During the winter months, when their diet contains less plant foods and more fat, the *Actinobacteria* group dominates. *(PLoS One 2014 Mar;9(3):e90731)*

You Are What You Eat

The takeaway from this research is that the composition of the microbiome is determined by diet. So that begs the question: When you shop for groceries, do you shop to feed yourself (the 10 percent of the cells in your body), or do you shop to feed the other 90 percent of the microorganisms in your body that control your health?

Next time you're in the grocery store, think about the items you put in your cart in a different way. Ask yourself if they feed your gut bacteria properly. Most of us shop without any regard to our microbiome. The half-gallon of ice cream, cookies, and potato chips might taste good, but the bugs in your gut will starve on that kind of diet.

Our intake of fermented foods and fiber—the things that feed the microbiome—has decreased significantly compared to how our ancestors ate, and it's reflected in how prevalent obesity, diabetes, cardiovascular disease, autoimmune problems, cancer, and Alzheimer's are in this country.

Beneficial Butyrate

Pathogenic bacteria thrive on sugar and other simple carbohydrates. Conversely, the beneficial microbes in our gut feed on insoluble fiber—the fiber that our digestive system can't break down.

Beneficial bacteria love insoluble fiber from beans, legumes, seeds, bran from grain, the tough, woody ends of asparagus stalks, the pith of grapefruit, the strings on celery, etc. In fact, as far as our microbes are concerned, we throw away the best parts of the vegetables and fruits that we do eat.

Microbes "digest" these fibers through fermentation, and the byproducts of this process are SCFAs—one of which is called butyric acid, or butyrate. Our microbes produce numerous beneficial byproducts, but butyrate is one of the most studied.

Butyrate is the primary energy source for the cells that line the walls of the gut. As a result, they strengthen the cell wall barriers and help prevent leaky gut syndrome—a condition where intestinal debris and toxins pass through microscopic gaps in the cell wall and enter the bloodstream. High levels of butyrate are associated with decreased rates of inflammation, Crohn's disease, irritable bowel syndrome, and autoimmune issues.

Butyrate is one of the compounds produced by friendly gut microbes that can control the expression of genes. Butyrate elicits a mechanical switch that inhibits the development and growth of cancer in colon cells. In other words, butyrate is the reason roughage helps prevent colon cancer. *(Int J Cancer 2011 June;128(11):2591–601)*

Speaking of colon cancer, recently the US Preventive Services Task Force released recommendations for taking aspirin daily to help prevent colon cancer. I strongly suggest that you not follow this advice—not even 80 mg baby aspirin.

Cancer cells contain abnormally high amounts of the protein called interleukin-6 (IL-6), which interferes with natural cell

suicide and makes cancer cells practically immortal. Nonsteroidal anti-inflammatory drugs like aspirin block the actions of IL-6. However, butyrate does the same thing—without the side effects of aspirin. *(Carcinogenesis 2004 Nov;25(11):2247–55)*

Aspirin can cause serious bleeding, including stomach bleeding, and increases the risk of hemorrhagic stroke and macular degeneration. And if internal bleeding and blindness aren't enough to dissuade you from taking aspirin, maybe the latest research will.

Researchers at the University of California, Irvine, found that although taking aspirin regularly can somewhat reduce the risk of cancer, if cancer does develop, it is far more difficult to treat. Much like the overuse of antibiotics has helped create drug-resistant superpathogens, aspirin has been shown to boost a cancer's ability to produce more aggressive, mutant cells that are resistant to treatment. *(JR Soc Interface 2017 Sep;14(134))*

Research has also found that butyrate and propionate—another SCFA produced by microbiota-induced fermentation—increase metabolism, improve insulin sensitivity, and protect against diet-induced obesity. In other words, they are are instrumental in preventing obesity. Considering the lack of dietary fiber in the diet these days, it's no wonder obesity has become such an issue. *(World J Gastrointest Pathophysiol 2015 Nov;6(4):110–9)* *(Obes Rev 2013 Dec;14(12):950–9)*

The creation of butyrate and other SCFAs is primarily dictated by the number of SCFA-producing bacteria present in the colon. The primary food source of butyrate is butter, from which butyrate got its name. It contains 3–4 percent butyrate. Ghee (clarified butter) has been used therapeutically for thousands of years in Ayurvedic medicine, as well as in cooking and religious ceremonies. I suspect many of its positive attributes may be related to its butyrate content.

To increase SCFA-producing bacteria numbers, make sure you're regularly consuming fermented foods and a quality probiotic supplement to help provide the microorganism "seeds" and starters. Then to help these organisms flourish and bloom, you must increase fiber consumption.

Increase Fiber with Minimal Side Effects

Increasing fiber consumption can initially be difficult for some people. This is particularly true among individuals suffering from severe bowel inflammation like Crohn's and inflammatory bowel disease. In past issues, I've discussed in detail how to deal with these problems using everything from butyrate supplements to fecal transplants. If you have these health issues, you must get them under control before significantly increasing your fiber intake.

For most people, the main issue with eating more fiber is gas. Remember, in the process of creating the beneficial SCFAs, microbes ferment this fiber—and the fermentation process produces gas. The simple fact that you've even got gas (and two or three bowel movements a day) is proof that these bacteria are working. However, there are some ways to minimize the discomfort and still achieve a more balanced microbiome.

Keep in mind that fiber is a complex carbohydrate. A carbohydrate has three components: fiber, starch, and sugar. Both fiber and starch are considered complex carbohydrates, while sugar is a simple carbohydrate. For optimal health, you want to limit simple carbohydrates, but increase your intake of complex carbohydrates (fiber and resistant starches—starches that resist digestion by the body, but are broken down through fermentation by beneficial bacteria).

Here is how to add more complex carbohydrates into your diet:

- **Be gradual.** Start small and add a little more fiber to your diet every day. It takes the gut bacteria a little while to rise in number to handle the extra load. If you haven't consumed fermented foods, probiotics, or much fiber, expect an initial increase in gas. More than likely, the pH of your gut is too alkaline. As beneficial bacteria begin taking over, the pH will start to become more acidic. In the process, it will pass through a pH range, which just happens to be most favorable for gas-producing organisms. If this happens, you will temporarily experience excess gas, bloating, and intestinal discomfort. Unfortunately, this temporary situation is what makes most people quit and go back to their old dietary habits. If this happens, just slow the process down and give the beneficial microbes time to flourish and catch up. Once you pass through this pH range (anywhere from a few days to two weeks), if your

How to Make "Gasless Beans"

Do you love beans, but they don't like you? Almost everyone who enjoys beans would eat them more often if it weren't for the gaseous side effects. Here are two ways to reduce this unwanted side effect of eating beans.

Add Apple Cider Vinegar

Beans have a high concentration of indigestible oligosaccharides, such as raffinose and stachyose. These starches aren't absorbed in the small intestine, and when they pass into the large intestine, bacteria cause them to ferment and produce gas. The trick is to break down these stubborn starches so they can be digested.

When the last half-hour of cooking time for your beans arrives, remove ¼ cup of liquid and add ¼ cup of apple cider vinegar. Bring the pot to a boil again, and simmer until done.

(If you add the cider vinegar at the beginning of cooking, it will toughen the beans and lengthen the required cooking time. Salt should also be added after cooking, because it will lengthen cooking time if added sooner.)

This cooking method works extremely well for pinto and black beans and reasonably well for kidney, lima, and other types of beans.

Sprout Beans Before Cooking

Another way to eliminate intestinal tremors is to sprout your beans for two days before cooking them in the traditional manner. This process changes the chemical structure of the troublesome carbohydrates, but honestly, I think it changes the taste of the beans too. This is why I usually prefer the vinegar method—but both work!

digestive enzymes are adequate, you'll be on the road to a healthy colon. Remember, it's okay to slow things down or even take a break for a few days.

- **Make sure you include a wide variety of fruit and vegetables.** Experiment with all types of raw greens. Include the stems. Chop them into smaller pieces if necessary. Olive oil, salt, and pepper work wonders. It's amazing the variety of high-fiber vegetables available now in most grocery stores and, even better, farmer's markets. Locally grown produce is best, when available, since it contains the microbes that work best in your particular environment. Experiment with what's available in your area. Being close to the Mexican border, my grocery stores carry great high-fiber foods like jicama and cactus pads. Other favorites include plantains, asparagus, artichokes, squash, zucchini, mushrooms, kale, nuts, and seeds.
- **Include beans and legumes.** Microbes love these high starch foods. In the beginning, you can reduce gas by cooking "gasless beans." (See the box above for how to make these.) But as your gut becomes more acclimated, making these won't be necessary.
- **Eat more onions, garlic, and leeks.** In addition to sulfur, these foods contain inulin fiber, which gut bacteria love. To best feed your microbes, these foods should be eaten raw. However, they can also be very lightly sautéed. Although they taste great caramelized, this transformation doesn't leave anything for your microbes to feed on. The answer is to eat them both ways...cooked and raw. In fact, I believe an onion a day is more effective than an apple a day when it comes to keeping the doctor away.
- **Add resistant starches into the mix.** In addition to feeding microbes, some resistant starches, like raw potato starch, help stabilize blood sugar levels. Along with beans and legumes, other resistant starches include green bananas, and cooked and cooled rice, potatoes, and pasta. If this surprises you, read on…

Potatoes and Pasta... Really?

Yes—potatoes, rice, and even pasta are starch resistant if you cook and cool them before eating. The secret to making them starch resistant is the cooling. They become more resistant to normal digestive enzymes and the body treats them more like fiber than carbohydrates. So, if you like potato salad, cold pasta salad, or cold rice (sushi, rice pudding), these are great foods to feed your microbes.

Doctors in the UK recently ran a test to determine if pasta could be reheated after being cooked and cooled, and still be a resistant starch. Surprisingly, it was. In fact, reheating it made it even more resistant than when it was eaten cold.

I routinely save baked potatoes from the night before and have them for breakfast with eggs the next morning...sliced thin,

seasoned, and browned with a little butter in the skillet.

Now you can even buy raw potato starch powder (such as Bob's Red Mill Unmodified Potato Starch). It's a great way to add resistant starch to your food without any special cooking.

You can also use banana or plantain flour (6 g/Tbsp), high-maize corn flour (5 g/Tbsp), regular cornstarch (2.5 g/Tbsp) and white or brown rice flour (1.5 g/Tbsp) as resistant starch sources. But I prefer potato starch. Not only is it less expensive, it provides the most resistant starch per tablespoon (8 g/Tbsp).

If you're just getting started at feeding your microbes, potato starch powder can often ease the transition into more fiber-rich foods. It shouldn't be heated or cooked since that changes the structure. You might start by adding a tablespoon of powder to some unsweetened live yogurt. Gradually work your way up to 2 to 4 tablespoons a day. If you experience gas, then you might try adding an equal amount of psyllium husk powder.

Uncooked potato starch powder can be added to other foods, as well. You can sprinkle it on top of mashed potatoes, which reportedly keeps blood sugar from spiking practically at all. That's great news for anyone with type 2 diabetes who misses mashed potatoes. Another suggestion is to add it to no-bake cookies. Personally, I include it in my morning protein shake.

Even better, potato starch powder (*not* flour) is dirt cheap. In bulk, you can get a pound for around $2.

Final Thoughts

In closing, I should mention that the microbes in your gut are going to eat one way or another. If you starve them by not providing enough roughage, there's a corresponding increase in *Akkermansia muciniphila*. These bacteria are "mucin degraders." Mucin forms the protective layer in the gut and safeguards the epithelial cells that form the gut wall. These bacteria feed on the mucin and leave the gut wall directly exposed to microorganisms and toxins.

In a nutshell, if you don't feed your gut bacteria properly, they will start to break down the lining of your intestines. This is how countless intestinal problems begin.

But when you nourish your little intestinal friends, they will reward you by producing SCFAs like butyrate. They will help strengthen your gut walls, improve digestion, break down toxins, and remove them from the body. They will keep pathogenic bacteria in check, help ward off depression, obesity, cancer, heart attack, stroke, and type 2 diabetes, and increase your overall health and longevity.

So if you need a worthwhile health goal this year, supporting your microbiome by increasing the amount and variety of fiber in your diet should be at the top of your list.

Until next month,

Dr. David Williams

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