

Show Your Liver Some Love

I really don't like to make predictions. For one, there's always the possibility that I'll be wrong. But also, when they relate to our society's health, more often than not they are depressing. Most long-term predictions tend to be negative. Thus far, it seems our focus has been on living longer lives, with far less attention being paid to actual quality of life.



Dr. David Williams

Certainly, there's a lot of lip service and mission statements claiming otherwise. With the Affordable Care Act

(Obamacare), Medicare, Medicaid, and insurance companies ushered in the new age of value-based health care. Unfortunately, its objective was to deliver health services at a lower cost, but not necessary improve one's actual long-term health.

I believe the primary goal should be helping people of every age achieve optimal health. And when I refer to health, I mean the true definition: "the absence of disease." But over time, that definition has changed.

As a disease becomes more commonplace within our society,

for some reason, we no longer think of it as a disease. It becomes a condition, or just an acceptable consequence of the aging process.

When is the last time you heard someone with high blood pressure or even diabetes say they have a disease? Instead they have a condition or health issue that needs to be kept under control. This mindset is the direct result of brainwashing (advertising) by the pharmaceutical companies over the last few decades.

Our society has gradually been convinced that our bodies are no longer capable of curing disease. Rather, we've been led to believe that our bodies require pharmaceuticals to help treat symptoms and manage diseases. As bizarre as this would have sounded to earlier generations, most people now believe that with the continuous use of drugs, they can remain healthy.

Unfortunately, the very large majority of drugs are actually formulated to manage, not cure, diseases. The obscene profits of pharmaceutical companies depend on repeat sales and customers needing lifelong prescriptions. It would be hard to stay in business selling cures. There's also a good reason why so many doctors claim to practice "medicine," not "health

care." And, if you let them, they're happy to practice on you.

Earlier in our history, communicable or infectious diseases contributed to most deaths. These days, it's chronic, non-communicable diseases like obesity, heart disease, stroke, type 2 diabetes, and cancer. These diseases are directly related to our dietary choices and lifestyle habits. Changes to these habits require knowledge, a little discipline, and acceptance of responsibility. It's the lack of these attributes that has made diseases that were once only present in the elderly more commonplace in young adults and adolescents. This has happened with obesity, type 2 diabetes, high blood pressure, heart disease, depression, hormonal imbalances, arthritis, cancer, and dozens of other diseases.

The ever-increasing dependence on drugs and overall poor lifestyle choices in this country are also why it's so easy to make predictions about our future health—and why, for the most part, they continue to be negative.

More than 10 years ago (in January 2008), I wrote an article titled "Heal Your Liver Now." I predicted that non-alcoholic fatty liver disease (NAFLD) would escalate into a major problem, even

though it was a preventable one. At that time, it was estimated that 5–10 percent of the US population had NAFLD. I explained why I expected that number would increase dramatically. I also outlined specific steps you could take to make sure you weren't part of that trend.

My warning didn't have as much of an impact as I had hoped because today, NAFLD is present in at least 30 percent of the general population...and it is continuing to rise. This is yet another example of an "adult disease" that we're now seeing in adolescents and young adults. NAFLD has become the most common liver disease among adolescents. Being overweight as young as age 8 greatly increases the risk.

If more than a quarter of the population has fatty liver disease, there are a lot of people walking around oblivious to the fact that they have it.

For most people, at least in the beginning, it doesn't cause any noticeable symptoms. Typically, it's discovered during routine lab tests, when elevated liver enzymes are detected in the blood. It may also show up in an abdominal ultrasound. If left untreated, it progresses to advanced inflammation and fibrosis (cirrhosis), complete liver failure, or liver cancer. NAFLD is the second

most common indication for liver disease in the United States.

No medicinal treatments exist to halt or reverse NAFLD. It requires a change in lifestyle and nutrition.

Most people still associate liver disease with excessive alcohol consumption or viral hepatitis. While both are very serious and problematic, they haven't been the primary driving force behind the epidemic of liver disease we're now experiencing. In addition to alcohol and viral hepatitis, there are more than 100 other causes of liver disease, but obesity and insulin resistance (type 2 diabetes) are now the leading causes. NAFLD is found in over 80 percent of patients who are obese.

While it's not as common, fatty liver disease can also develop in individuals with normal body weight. In these cases, common culprits include poor diet, blood-sugar handling issues, nutritional deficiencies, poor digestive and bowel function, and altered bowel microbiota, as I'll explain.

In the January 2008 issue, I went into detail about liver function and natural methods that have been shown to help reverse fatty liver disease. If you have liver problems, I definitely suggest rereading that issue. While I'm going to provide additional new research in this article, here's a very brief recap of

the recommended nutrients from that earlier article.

If you're overweight and in the early stages of liver disease, losing weight is imperative. At this stage, liver damage is reversible. Even modest weight loss has been proven to significantly reduce liver inflammation as well.

During the weight loss period, you'll want to make sure you're providing your body with adequate antioxidants to protect against the damaging effects of toxins and free radicals being released. These should include vitamins C (2 to 4 grams daily) and E, coenzyme Q10, lycopene, and lutein.

Additionally, to support liver function, I recommend N-acetylcysteine (500 mg daily or more), milk thistle (500 mg daily), the amino acids L-cysteine and L-methionine (500 mg of each daily), and alpha lipoic acid (100 mg daily).

The Choline Connection

Another compound that is absolutely essential for liver health and regeneration is choline. But at least 90 percent of the entire US population doesn't consume the daily required amount of choline. Choline deficiency is one of the most widespread nutritional deficiencies in our society today.

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The daily recommended amount of choline in the diet is 550 mg for men and 425 mg for women. However, I suspect these minimums are still too low for optimal health. Choline intake in this country now averages only 320–380 mg per day.

One study found that, when daily choline intake was reduced to only 50 mg per day, 80 percent of postmenopausal women, 44 percent of premenopausal women, and 77 percent of all men developed fatty liver and/or muscle damage. To reverse liver damage, you need to take at least 825 mg per day. ([*Am J Clin Nutr* 2007 May;85\(5\):1275–85](#))

Choline is readily available and can be taken as an independent supplement. Choline-rich foods include egg yolks (two jumbo yolks provide roughly 300 mg), sardines (½ cup has about 70 mg), and fish eggs (raw salmon eggs, for example, will give you 47 mg of choline).

Other sources include animal liver, brain and organ meat, scallops, raw oysters, shrimp, cod, cauliflower, and peanut butter. Many people shun several of these foods (egg yolks, organ meat, etc.), and that alone is

contributing to the increase in fatty liver disease incidence. Getting adequate amounts of choline can be particularly challenging for vegans, too, who avoid almost all of these foods.

I also recommend lecithin and personally add it to my morning protein shake. (Sometimes I think my shakes contain everything but the kitchen sink.) Two tablespoons of lecithin granules contain roughly 434 mg of choline. Although I take lecithin primarily to prevent and/or reverse atherosclerosis, the choline content is an added bonus.

Our bodies need choline to make numerous essential compounds, one of which is phosphatidylcholine (PC). PC is classified as a lipotropic compound. It promotes the export of fat from the liver and encourages it to be metabolized for energy, so it doesn't accumulate and cause a fatty liver.

If you get nothing else from this entire issue, hopefully you'll understand how essential it is to increase your daily choline consumption. A choline deficiency isn't just a problem when it comes to fatty liver disease; it's associated with cardiovascular disease, male

and female infertility, Alzheimer's, memory problems, depression, suicide, aggressive behavior, autism, chronic fatigue, eye issues, muscle spasms, irregular heartbeat, and nerve pain.

When one-third of all Americans have fatty liver disease and 90 percent of the population is choline deficient, there's a pretty good chance you fall into one of those groups.

Advanced Liver Disease

Even if liver disease progresses in severity, there is still a chance to get the situation under control. In advanced cases, researchers have discovered a combination of supplements so effective that it has been used to successfully treat patients who were scheduled for liver transplant surgery. Within a relatively short period of time on this protocol, the surgery became unnecessary.

As such, the supplements used in this study should definitely be recommended to treat severe liver disease: 600 mg of alpha lipoic acid, 400 mcg of selenium, and 900 mg of silymarin daily in two or three

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divided doses. ([*Med Klin \(Munich\)* 1999 Oct 15;94 Suppl 3:84-9](#))

Avoid HFCS...

There seem to be several factors that most doctors overlook (or don't understand) when it comes to obesity, fat accumulation, and the development of fatty liver disease.

One is the disastrous effects of high fructose corn syrup (HFCS) that has become so common in our food supply. Simply put, HFCS is a killer. It leads to obesity, metabolic syndrome, diabetes, and cardiovascular disease.

Research has also found that HFCS contributes to poor mitochondrial function (low energy levels), and it inhibits the liver's ability to properly metabolize fat. In simple terms, this means that fructose makes the liver accumulate fat. When fructose was combined with a high-fat diet, the situation was even worse.

Mitochondria are the small "power plants" residing in each cell. Researchers compared the mitochondria in animals fed a high-glucose, high-fat diet to those in animals fed a high-fructose, high-fat diet. The mitochondria of the animals on the high-glucose, high-fat diet remained healthy, had a nice ovoid shape, and burned fat normally. However, the mitochondria of those on the high-fructose, high-fat diet were fragmented and unable to burn fat, causing the fat to be stored within the liver. ([*Cell Metab* 2019 Oct 1;30\(4\):735-53.E4](#))

Sucrose (table sugar) is also detrimental to the liver. It is comprised of 50 percent glucose and 50 percent fructose, so it is far from harmless. While HFCS only contains 42–45 percent fructose,

that fructose is "free" fructose. It isn't bound to glucose like it is in regular sugar. For the fructose in table sugar to be absorbed, the sugar must first be broken down by the intestinal mucosal cells. The unbound, free fructose in HFCS, however, is able to enter the bloodstream far more rapidly.

Research has demonstrated that even small levels of fructose in the blood can quickly deplete adenosine triphosphate (ATP) in the liver. ATP is the cellular "energy storage" molecule. Without ATP, liver cell function declines, followed by inflammation and scarring. The dangers of free fructose found in HFCS are hard to overstate.

HFCS is found in thousands of processed foods and soft drinks. I have no doubt it has helped fuel the epidemic of NAFLD we've seen over the last few decades.

... And BVO

In some soft drinks, you'll find another potential liver-damaging compound called brominated vegetable oil (BVO), an ingredient very few people know about.

BVO is considered an emulsifier that is added to help keep citrus essential oil flavorings in suspension instead of separating out in sodas and other beverages. Studies have shown that BVO can lead to fatty infiltration of the liver.

The use of BVO has been banned in the European Union, Japan, and India. Coca-Cola and PepsiCo don't use it in soft drinks sold in Australia or New Zealand.

Around 2012–2014, both companies said they were going to remove BVO from all their products in this country, but after the

controversy at that time died down, apparently PepsiCo didn't follow through.

Obviously, I don't recommend drinking any soft drinks. But the ones sweetened with HFCS and laced with BVO are even higher on my list of things to avoid.

You can check labels, but when I last looked, it seems like Coca-Cola has removed BVO from their products, while PepsiCo and others haven't. The list below of sodas that contain BVO is short and incomplete. There are dozens of local and private-label sodas, and many of those contain the compound.

- **Mountain Dew**
- **Squirt Citrus Burst**
- **Sun Drop Citrus Soda**
- **Stars & Stripes Fruit Punch Soda**
- **H-E-B Citrus Rush**
- **Hillbilly Holler**
- **Fresca, Peach Citrus**
- **Fresca, Sparkling Citrus**
- **Chek Kountry Mist Soda, Citrus**

Lastly, you'll want to avoid statins/cholesterol-lowering drugs. These medications have been shown to cause a choline deficiency.

The Role of Bile in Liver Health

For decades now, I've been stressing the importance of bile—the digestive enzyme produced in the liver and stored in the gallbladder. On this topic, I seem to be a lone voice in the wilderness. Hopefully this will change.

Numerous studies have shown that individuals with NAFLD have imbalances in their bile production. Among other functions, proper bile acids and salts are necessary for fat

digestion and cholesterol utilization. Some studies have shown that consuming synthetic bile acid can improve NAFLD, but those studies have been small and few.

The role of bile and how it is produced, regulated, recycled, etc. is complex, and its exact role in NAFLD isn't yet understood. Having said that, I personally have seen several patients benefit from natural ox bile supplements. The only product I've used this way has been Cholacol, made by Standard Process Laboratories. Before trying it for this condition, I would suggest talking to your health care professional.

There is another way anyone with NAFLD can positively influence and help rebalance bile production. Research has shown that an imbalance in the intestinal microflora adversely affects the reabsorption and the feedback mechanisms in normal bile production. Reestablishing the

beneficial bacteria in the bowel is imperative in treating NAFLD. This can be done with a quality probiotic and increasing the amount and frequency of fermented foods in the diet. This is an area I've covered in great detail many times in the past.

While NAFLD is due to factors other than alcohol consumption, some of the latest research has revealed that over 60 percent NAFLD patients have gut bacteria that actually produce large amounts of alcohol. ([*Cell Metab* 2019 Oct 1;30\(4\):675–688.e7](#))

This unusual finding occurred when one of the researchers had a patient with severe liver damage combined with a rare condition called auto-brewery syndrome (ABS). Patients with ABS get drunk after eating alcohol-free/high-sugar food. Testing of this patient's feces revealed strains of *K. pneumonia*. These particular strains were found to generate four to six times more

alcohol, compared to strains found in healthy individuals.

Researchers then sampled the gut microbiota of 43 NAFLD patients and 48 healthy people. Roughly 60 percent of NAFLD patients had several strains of the high- and medium alcohol-producing *K. pneumonia* bacterium in their gut, compared to only 6 percent of the healthy controls.

These bacteria continuously convert carbohydrates to alcohol, flooding and damaging the liver—just as if the person was drinking alcohol, except the victim doesn't have a choice.

In this study, researchers were able to reverse the condition by giving antibiotics that killed *K. pneumonia*. This is just one more of a hundred reasons for regularly including fermented foods and a daily, quality probiotic supplement in your regimen. ■

Lessons From the Tsimane People

I've had the opportunity to travel around the world in search of products, therapies, and lifestyles that not just support good health, but have also been known to prevent and cure disease. Some of my more interesting trips have been to areas where the local (and often, isolated) populations have traditionally lived longer-than-average lifespans, or experienced extremely low rates of certain diseases.

My goal has been to study what these societies are doing differently and see if it would be beneficial (and practical) to implement their habits into our lives. On the flip side, it's interesting (but heartbreaking) to observe how the health in these

societies changes once they begin to adopt a more Westernized lifestyle.

Over the last couple of decades, areas like these have started to disappear. A good example of this is in Bolivia, a landlocked country in South America bordered by Peru, Paraguay, Chile, Brazil, and Argentina.

Several years ago, anthropologists began collecting data on an indigenous population called the Tsimane in the Amazon region of Bolivia. This population survives through traditional hunting, fishing, gathering, and primitive farming. Their diet consists primarily of plantains, rice, manioc, maize, and native fruits, in addition to

lean game, freshwater fish, and occasional honey. According to research, they had the lowest reported prevalence of atherosclerosis (clogging of the arteries) of any population ever recorded. Based on CT scans, coronary artery calcification, and other standard tests, 85 percent of those over 40 years old had absolutely no risk of heart disease whatsoever, 13 percent had a low risk, and only 3 percent had a moderate or high risk. ([*Lancet* 2017 Apr 29;389\(10080\):1730–9](#))

Among 80-year-old Tsimane people, 65 percent had almost no risk of heart disease and only 8 percent had even a moderate risk. An 80-year-old

Tsimane had the same arterial age as an American in his or her mid-50s.

Not surprisingly, hypertension, obesity, high blood sugar, and regular cigarette smoking were also very rare in this population.

The Tsimane diet is high in complex carbohydrates from the crops in their fields. Non-processed carbohydrates, including plantains, rice, corn, and nuts, make up roughly 72 percent of the food they eat. Their diet contains no trans fat and very little saturated fat. Protein accounts for 14 percent of their average diet and is comprised of meat from wild pigs, fish, capybara, etc. Native to South America, capybaras are the world's largest rodents, getting as big as a large dog (4 feet long and more than 100 pounds). To me, they look like a giant guinea pig. While the Tsimane eat them, a few people here in Texas have them as pets. If you live in Texas or Pennsylvania, you can legally own one.

These people are very physically active, not through exercise, but rather from work. They spend an average of six hours daily in physical exertion and walk 16,000–17,000 steps a day. While these habits coincide with what we typically accept as “heart healthy,” a few other aspects were harder to reconcile.

For one, their “good” cholesterol (HDL) was extremely low (consistently below 40 mg/dl). It was so low that, by our standards, these people would be considered high-risk cardiac patients.

Also, the Tsimane, by every biomarker tested, had constantly elevated levels of inflammation. The general consensus in the US is that elevated levels of low-grade

inflammation is directly related to atherosclerosis.

I can't explain the HDL cholesterol situation other than the fact that more and more research has debunked the importance of LDL cholesterol's role in cardiovascular disease. HDL is a method of cholesterol transportation throughout the body and while higher levels have been assumed to be a marker for a healthy cardiovascular system, apparently there are other factors involved.

As for the inflammation, it was found that most of the Tsimane are infected with intestinal worms. The researchers noted that the Tsimane with worms had the lowest levels of cholesterol and the highest energy expenditures. It may be that the worms, much like intestinal bacteria, live “in harmony” with the Tsimane and help modulate and down-regulate the immune system to ensure their own survival.

Also, the inflammation experienced by the Tsimane is different from that we typically experience in our society. Theirs is a result of acute infections from working and living in a more primitive environment. Ours is a type of “sterile” inflammation. In other words, our inflammation comes from things like periodontitis, smoking, and obesity, where free radicals and toxins are constantly being released into the system.

I've been following this research coming out of Bolivia for some time, and just recently there's been a follow-up study. The details of this latest research, collected from 2002 through 2010, while disheartening for the Tsimane, is a glimpse into the downside of our

more modern way of life. ([*Obesity* 2019;27\(8\):1347–59](#))

Over the last several years, the Tsimane population has continued to grow, and encroachment from development has put pressure on their sources of wild game and fish. This encroachment has brought new forms of employment and opportunity for schooling, both of which has reduced their dependence and implementation of cultural knowledge and lifestyle practices.

The Tsimane also now have greater access to commercially processed foods like grains, sugar, cooking oil, domestic animals like pigs and chickens, and animal products such as eggs.

The combination of these factors has resulted in the following:

- **Tsimane women's prevalence of overweight and obesity increased from 22.6 percent and 2.4, respectively, to 28.8 percent and 8.9 percent.**
- **Men's prevalence of overweight and obesity rose from 16.2 percent and 0.7 percent, respectively, to 25 percent and 2.2 percent.**
- **More use of cooking oil was associated with increased body mass index (BMI) among females, while consumption of domesticated animal products did not change significantly but was positively associated with female BMI and male waist circumference.**
- **Household calories did not increase to a statistically significant degree, and homegrown crops still accounted for the bulk of household calories. But the odds of cooking oil use increased by 24 percent each year, nearly doubling the number of study households using it. By 2010, this included 30 percent of households—much lower than in industrialized populations.**

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NEWS TO USE *from around the world***Gut Health & PTSD**

RICHMOND, VIRGINIA—Researchers at Virginia Commonwealth University have discovered a novel treatment method that could help veterans and other patients suffering from post-traumatic stress disorder (PTSD).

I've talked before about the gut-brain axis. This is the direct connection through which microbes in the gut influence brain cells by way of the tenth cranial (vagus) nerve. Microbes in the gut control mood, food cravings, and numerous other parameters of mental and physical health. For example, if your gut contains an overabundance of microbes that thrive on simple carbohydrates, they can send chemical signals through the vagus nerve to the brain that elicit an immediate, intense craving for sweets.

One of the characteristics of PTSD is the impairment of cognition or brain function. PTSD sufferers are often depressed, mentally sluggish, and confused. In severe cases, they will often lose consciousness. They experience these symptoms whether or not they are taking antidepressants or other medications that act on the brain.

In this study, researchers wanted to see if there was any connection between these symptoms and the makeup of the gut's bacterial flora. They analyzed fecal samples from 93 male veterans. About one-third of them had combat-related PTSD. The rest were also exposed to combat but had not developed PTSD.

Those with PTSD showed significantly poorer performance on cognitive exams than non-sufferers. Additionally, those with PTSD had less diverse and far fewer types of bacteria than the non-PTSD group.

This was true even after taking into account other medical issues and use of alcohol and psychotropic drugs.

Along with the lack of diversity, those with PTSD also had a greater number of potentially harmful forms of bacteria, such as *Enterococcus* and *Escherichia Shigella*, and fewer beneficial forms like *Lachnospiraceae* and *Ruminococcaceae*. The first two types are common in those suffering from depression. The latter two are prevalent in those with healthy guts and have been associated with better cognitive performance. These strains also thrive on the breakdown of complex carbohydrates from fibrous whole grains, fruits, and vegetables.

This study didn't answer whether the changes in gut bacteria were triggered by combat trauma, or if they happened afterward over time. However, the researchers were convinced that PTSD symptoms could be significantly eased by restoring the balance of the gut microbiome. ([Am J Physiol Gastrointest Liver Physiol 2019 Aug 28. doi:10.1152/ajpgi.00194.2019](#))

EGCG & Antibiotics

GUILDFORD, UNITED KINGDOM—Researchers at the University of Surrey have stumbled upon an easy, natural way to reduce antibiotic resistance, which is quickly becoming a global health threat.

Pathogenic strains of bacteria that would normally succumb to traditional antibiotic therapy have mutated and adapted to current antibiotics. This is largely due to their gross overuse in patients as well as in agriculture and livestock.

A 2013 report from the CDC found that at least 2 million people in this country alone got an antibiotic-resistant infection and

at least 23,000 died from it. A new report is expected to be released for 2019, and I expect those numbers will increase.

The researchers in this study were concerned with *Pseudomonas aeruginosa*, which is associated with serious respiratory tract and bloodstream infections. In the last few years, it has become totally resistant to several major classes of antibiotics and very hard to treat. It is now showing resistance to last remaining working line of antibiotics.

Research has already shown that epigallocatechin (EGCG), a primary component of green tea, exhibits antibiotic activity. So in this study, researchers tested EGCG's effectiveness against *P. aeruginosa* alone, then with the antibiotic of choice, aztreonam. A combination of the two was significantly more effective at reducing *P. aeruginosa* numbers than either agent alone. ([J Med Microbiol 2019 Oct;68\(10\):1552-9](#))

If you ever have the misfortune of contracting an antibiotic-resistant infection, adding EGCG to antibiotic therapy could restore its activity and enable you to fight off the infection. There are other natural antibiotic compounds that might work as well, such as garlic, oregano, echinacea, and grapefruit seed extract.

Numerous supplement companies sell green tea extracts that are standardized to contain certain levels of EGCG. EGCG is also available in a bulk powder. This study didn't provide a specific dose for humans. However, the recommended dosage of a product standardized to 98 percent polyphenols with 50 percent EGCG, is typically capped at 1,000 mg a day.

- While sugar intake increased by about 13 percent annually, neither sugar nor refined grains had detectable associations with changes in body fat.

I have no doubt the health and lifestyle changes of the Tsimane will continue to be followed and reported in the years to come. Although we don't have the final story, some things seem abundantly clear.

The introduction of vegetable-based cooking oils into their diet will lead to an overall deterioration of their health, particularly their absence of cardiovascular disease. Routinely using cooking oil can be a hard habit to break. Although it can enhance the flavor of the food being cooked, each tablespoon adds 120 calories and 14 fat grams to the diet. Few foods that have that much of an immediate impact.

Maybe it hasn't been made available to the Tsimane yet, but God forbid the introduction of margarine and other hydrogenated oils into their diet. If and when that occurs, we'll start to see very significant increases in cardiovascular risk in just a couple of generations.

Refined carbohydrates will also start to contribute to weight gain, metabolic syndrome, blood sugar problems, and eventually, diabetes. We've already experienced the detrimental health effects of refined flour, sodas, and sugar-loaded snacks over the last few decades in this country. A study just released in September looked at dietary trends in this country over the past 18 years. It found that low-quality carbohydrates from refined grains, starchy vegetables, and added sugars accounted for 42 percent of the typical American's daily calories. That is a failing report card

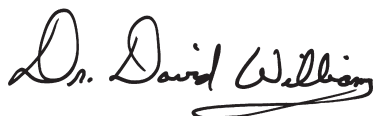
in anyone's book. ([JAMA 2019 Sep 24;322\(12\):1178-87](#))

At this point, the lesson to be learned is the same one we've been talking about for years. Avoid sugar and refined carbohydrates; increase complex carbohydrates, roughage and fiber-containing foods; increase activity; avoid rancid fats and vegetable oils; eat more fish, organic fruits, vegetables and meat products that are minimally processed; and establish closer family and community ties. Let me explain this last point...

Although it wasn't mentioned in either of the studies, the Tsimane people also have a special social habit that helps promote the diversity of their gut microbiomes. One of their favorite pastimes is drinking homemade beer. It is fermented in large vats and made from plantain, corn, or manioc (in this country, we refer to it as yuca). Visits among family and different households are linked with consuming beer. These gatherings are used to sing and share myths, tales of hunting, fishing, and other experiences.

These are all habits we can and should incorporate into our lives. However, I do have a couple reservations when it comes to the Tsimane lifestyle. I won't be eating any of my neighbor's pet capybaras. And I'm not sure about including intestinal parasites and worms in my health regimen. (I'd like to wait for a little more research before making that decision.)

I'll be back next month with my final newsletter issue. Until then, enjoy your Thanksgiving!



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