THE ULTIMATE ELIMINATION DIET TO ATTAIN OPTIMAL HEALTH AND HEAL YOUR BODY

CARNIVORE CURE

JUDY CHO, NTP

Foreword by Ken D. Berry, M.D.

The best selling author of *Lies my Doctor Told Me*

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nutritionwithjudy

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Carnivore Cure is the ultimate elimination diet to attain optimal health and heal your body

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In particular, if you are on prescription medications from your licensed physician or have been diagnosed with a psychological disorder, make sure to work with your medical team for any medical changes.

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1 Peter 4:10-11

Kevin. My rock and better half. For bringing me back to life.

Caleb and Aiden. For giving me the gift of motherhood.

Andrew. For balancing tough love and motivation.

Ellie. For 25+ years of unfailing friendship.

My parents for their unconditional love and support.

Thank you for believing in me and faithfully staying by my side, amidst all the rollercoasters.

CARNIVORE CURE

Foreword

IS THERE A proper human diet we all should eat? This question has baffled, confused, and stumbled people for thousands of years. Many among our medical and dietary leaders seem to think the human body is a magical thing. They believe that no matter what amount of processed junk (often advertised as healthy food) is shoveled into the human body, the body's magical biochemistry will turn that junk into healthy, lean body tissue.

Given the seemingly unstoppable obesity epidemic threatening all modernized nations, this magical belief is incorrect. No longer do we have the false luxury of eating whatever we want, taking a hand-full of pills, and expecting perfect mental and physical health as a result. More and more, our society's institutions, from farming to healthcare, are straining under the increasing burden of mass-produced food and mass-produced disease.

Perhaps there is a connection between the billion-dollar profits harvested by big-food corporations, who insist on producing products mainly from grains, sugars and vegetable oils, and the rising obesity of the consumers who eat these products. Perhaps the human body is not a magical cauldron that can turn nutrient-void, processed pseudo-food into healthy, lean bodies and minds. Perhaps there is a proper human diet spectrum that should be adhered to while avoiding all other things that are not species-appropriate food.

Two major weaknesses of modern medicine and nutrition experts are that they have been trained to only consider modern developments as possibly being better, and, often by negative feedback, they have been trained to stay in their own lane. It is rare indeed for a doctor to take into consideration what humans have eaten even a few generations ago. They cling to the false belief that everything in

moderation is okay. Health care providers are trained (perhaps accidentally) to keep to their own lane, discouraged from digging deeply into other medical specialties and other academic disciplines, such as nutritional science and perhaps even paleoanthropology. Many of their schools are sponsored by the very same big-food companies producing the pseudo-foods that are at the heart of the problem. Are we really to believe these companies exert no influence on what is being taught in these schools?

We have lost our way regarding what should make up a proper human diet. Other species seemingly have no problem with this concept in the wild. They will nibble a little of this, and eat a lot of that, always eating to satiety, and never becoming obese. Only when they have access to food-waste from human communities, do they stray from their instinctual eating patterns and become crippled by obesity and chronic disease. It is almost as if there is something in our current modern food products that clouds their instinctual judgment of what they should eat, and how much. It is becoming evident that this same clouding of instinctual eating patterns promotes chronic disease and obesity in humans.

Thanks in large part to social media's ability to expose the masses to alternate paradigms concerning the human diet, we finally have a chance to escape the poorly conceived recommendations of the healthcare and diet-care industries. These industries have been neutered, trained and muzzled by millions of dollars in donations from big-food and big-pharma corporations. Regular folks are slowly rediscovering the concept that what they eat -- and what they avoid – are both directly related to improving their health and reversing obesity. Despite fervent warnings from medical and dietary experts, people are rediscovering the ability of a meat-filled diet to nourish, satisfy, and satiate them.

One by one, people are waking up to the fact that processed foods containing grains, sugars, and vegetable oils act as slow-poisons in their bodies, insidiously leading them down a path of chronic inflammation, obesity, pain, fatigue, and disability. By removing these inflammatory, obesogenic substances from our diets, we can quickly start to see improvement in chronic physical and mental conditions and an improvement in our waist to height ratios.

In the nineteenth century and early part of the twentieth century, under-nourishment was quite common, and starvation was a very real risk. For a starving man, a loaf of bread is a blessing. For a chronically underfed child, initiating a diet of grains, sugars and vegetable oils will quickly correct the starvation, and seemingly correct the under-nutrition. Based on these results, modern societies ignorantly pursued policies guaranteeing an unlimited supply of these three commodities, evidently believing that since these pro-inflammatory and high-carbohydrate foods combated starvation and malnutrition.

It is now apparent, in hindsight, that these inferior foods did indeed improve malnutrition and vanquish starvation. Unfortunately, and probably unintentionally, they unleashed a host of new problems. Very few people now are under-fed, and starvation is something that happens very rarely in modern society. However, we are now faced with the realization that the foodstuffs that keep a human from starving to death may not be what humans should eat, must eat, for optimal health. Indeed, these foods are what emperors and kings have fed slaves and prisoners for all time. Grains, beans and cheap oils will keep slaves and prisoners alive but will never help them thrive. In order to rediscover a diet capable of optimizing human function, both mental and physical, we must get back to eating foods

that are optimal for humans to thrive. Carnivore Cure takes a more in-depth look into these foods.

Through a synthesis of findings from paleoanthropology, archeology, biochemistry, medicine and nutrition, plus new emerging research, combined with increasing mounds of anecdotal evidence, we are slowly rediscovering what a proper human diet is, and how it benefits humans of all ages. Depending on genetics, gut microbiome, age, past health conditions, and the current degree of physical activity, some humans seem to do fine on a plant-focused diet by adding plenty of seafood, eggs, and dairy, while others only seem able to achieve optimal health on a diet of red meat and water. Between this broad spectrum of eating, you can find the proper diet for you.

The Carnivore Cure elimination diet and reintroduction protocol will help light the path to find your personalized optimal diet.

Despite the much-touted epidemiological nutrition research for plant-based foods, one fact remains, animal products in the diet are a requirement for optimal personal health. Whether you function best as an ovo-lacto-pescetarian or a fatty red-meat carnivore, fatty meat of some sort is a requirement in the human diet to provide the best mental function, optimum physical performance, and most enjoyable positive mood. When it comes to reversing chronic disease, achieving ideal body-fat percentage, and realizing maximum physical and mental performance in the human species, make no mistake, meat must be on the menu. Carnivore Cure will show you the why.

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Introduction

A mind that is stretched by a new experience can never go back to its old dimensions.

—Oliver Wendell Holmes

Real meat saves lives**.**

FRUITS, VEGETABLES, WHOLE grains, and nuts can impede you from having optimal health. It's time to let go of the notion that we must incorporate fruits and vegetables for our mind, body, and soul. These very foods may be the reason for your chronic health ailments. In fact, limit buying from the produce section.

Digestive issues, joint pain, brain fog, and depressed mood? It might be the plant-based foods you're consuming.

If you've picked up this book, you're either embarking on a carnivore diet or are carnivore diet-curious. Or maybe you're tired of being sick and willing to try anything.

This book is for people who choose root-cause healing. No temporary supports here. Carnivore Cure will help beginners start a carnivore diet, and for people currently on a meat-based regimen, this book will provide additional fine-tuning of that lifestyle. And if you don't want to eat only meat for the rest of your life, don't worry — you don't have to.

The Carnivore Cure elimination diet will allow you to figure out what foods your own body can tolerate. It will help you identify what your specific food sensitivities are, as well as what foods will restore you to optimal health. A carnivore diet will get you close to this personalized food list, but sometimes you need a little extra support leveraging the healing powers of animal-based foods.

This book provides you a step-by-step path to optimal health while also providing extensive nutritional information and evidence-based support for following a meat-based lifestyle. I'll be debunking nutritional misinformation and providing lifestyle support through the lens of holistic health.

The Skeptics

If a meat-only elimination diet sounds absurd, try to stay open. Try to stop the human tendency of confirmation bias, where we lean toward favoring information that conforms to our existing beliefs and even subconsciously ignore evidence that does not fit.

We're all searching for objective truths and the optimal diet for humans. While we may never find absolute truth, being open and entertaining differing ideas may ultimately get us closer to that truth.

So why meat?

Meat has the most nutrients and provides the most absorbable form of nutrition when compared with any plant-based food. Additionally, no essential vitamins or minerals are missing from the animal kingdom. I'll cover this more in the book, but meat is the best baseline for an elimination diet, as most people have minimal food intolerances to meat.

You may ask: Do I need this book when the carnivore diet is so simple? Can't I just eat meat?

If you've taken a small peek into nutrition, you know it's complex. Meat is a great baseline food for healing. Sure. But what if you have a histamine intolerance? What if you need gut healing support? What if you can't tolerate fats? What if you have no gallbladder? How will minimizing carbohydrates impact your hormones? How much should you eat? When should you eat?

There's no right answer as to what foods are the best for you. You have to figure that out for yourself, and Carnivore Cure is here to support you. I have taken out most of the guesswork. These are some of the components considered as part of the Carnivore Cure elimination diet.

- Nutrient-density
- Antinutrients
- Metabolic disease
- Low carbohydrate diet
- Gluten-free
- Histamines
- Autoimmune
- Elimination diets

No one wants to be sick. Symptoms such as eczema, joint pain, and digestive issues may be commonplace, but that doesn't mean they are normal. These symptoms should not be part of your daily life. Optimal health is having *nearly* no symptoms. Optimal health means nearly no exogenous products (e.g., medicines and supplements) to Band-aid the symptoms.

Get to *your* root cause and find trigger foods that may cause you to have food sensitivities. Let's find the foods that work best for you and finally support you to be symptom-free, or as close to it as possible. You can heal because the right food *is* medicine.

Welcome to Carnivore Cure.

In this book, I share my research and the evidence found for Carnivore Cure. Stay open, question misinformation, and challenge

the status quo. Dig into the studies I've cited on topics that you have more interest in, and most of all, form your own opinions and beliefs. In this marathon of life, I hope I'm passing you a baton that can best support you. Carnivore Cure can help you on a smoother journey to optimal health and being your best self.

Balancing Real Life with Ideal Eating

Before taking a deeper dive into Carnivore Cure, I want to touch upon real life. While this book provides information on some of the best options for nutrient-dense foods, I do not subscribe to the dogma that it is the *only* option. As an example, while my family tries to eat grass-fed, grass-finished meats, we also consume conventional meat. We balance real life with ideal eating. Life is hard enough to navigate all the misinformation. Sometimes the disillusionment felt and lessons learned can be more than overwhelming.

I hope this book provides you with the ideals, and you can then apply the right balance for you and your loved ones. I'd rather see you eat conventional meats than stress the mind, body, and wallet searching for only grass-fed, grass-finished meats, and perhaps then give up on a meat-based diet. Your body is resilient. By removing most toxic foods and balancing ideal eating with real life, your body should take care of the rest. Trust your body.

My Story

I was born and raised in Los Angeles, California. My parents both immigrated to Los Angeles from South Korea in the 1970s. I had long planned to become a pediatrician but instead graduated from the University of California, Berkeley, and Yonsei University in Seoul with a double major in psychology and communications with a handful of courses in business administration.

Instead of becoming a psychologist after graduation, I spent more than ten years as a management consultant for a top business consulting firm. During that time, I managed to be thin by following a vegetarian diet (with occasional fish). But I also struggled with depression and anxiety. Over the years I also started using disordered eating to manage my weight. Some days I'd survive on five hundred calories and bottles of diet soda. Other days I'd binge until I was sick and then compensate with some common purging methods.

After I gave birth to my first son, I was diagnosed with severe postpartum depression. I was given antipsychotics and antidepressants and was heartbroken that I had to stop nursing. I attribute my health problems to a very low-fat vegetarian diet coupled with bulimia. Oddly, my bloodwork always showed my body was in excellent health. My doctor told me that my cholesterol numbers were desirable and that I was the epitome of optimal health. My doctor had no idea what I did behind closed doors or the state of my mental health. Eventually, because things got so bad, I decided to improve my own health.

A ketogenic diet resolved many of my bad eating habits, but being allowed to eat a small number of carbohydrates (a slice of bread daily) triggered my old behaviors. If I was stressed or sleep-deprived, I'd fall into my old habits of restrictive eating and bingeing. One serving of nuts became two. Then, somehow, the family-size container of nuts would be empty. Instead of stopping there, I'd crave something sweet, and on and on the vicious cycle went. The same thing would happen with ketogenic treats, which are invariably high in fat and sweetened with sugar substitutes. My cravings for sweets never went away while I was using sugar substitutes. As I dug into the science, I understood why. *Sugar is addictive*. Pure and simple.

Sweeteners are a great crutch on most days, but on stressful days, these sweeteners are the reason I'd find my way back to white sugar.

We’re taught that the best diet is everything in moderation, but moderation doesn’t work for many of us. We do better by abstaining. For me, being abstinent from carbohydrates 99 percent of the time, was unbelievably difficult, but 100 percent abstinence became easy.

Why?

Avoiding all forms of sugar (all carbohydrates) takes the decision-making out of eating. We no longer have to wrestle our finite amount of daily willpower into compliance. The world may have been made for moderation, but maybe like me, you can live your best life by abstaining. Let’s get you back to optimal health.

Chapter 1

The Elimination Diet: What It Is and Is Not

If someone wishes for good health, one must first ask oneself if he is ready to do away with the reasons for his illness. Only then is it possible to help him.

—Hippocrates

Most of us know that optimal health comes from food. Sure, a potato is a better option than a bag of potato chips. But what about the origin of the potato? What if everything in the process of getting that potato to us is making us sick? Food allergies cost Americans about $24.8 billion annually.[1]

Unfortunately, no lab test can accurately diagnose food sensitivities or allergies. Food sensitivities usually occur when some food disturbs the digestive tract, whereas allergies are an immune reaction that produces antibodies (immunoglobin E, or IgE). Allergic reactions can be fatal—think anaphylactic shock and EpiPens. Standard medical care relies on a combination of a person's medical history, skin prick tests, feeding tests under medical supervision (oral food challenges), and the results of testing for food-specific antibodies (IgE). But even with all this information, the diagnosis will not be ironclad.

Skin Allergies on the Rise?

The skin is the largest organ of the body and, as such, often shows the first signs of any trouble brewing within the body. In some cases,

the skin shows signs of internal disease before the disease progresses. Skin allergies are one sign that a person needs gut support.

We think of eczema, hives, and rashes as commonplace. While they may be commonplace, they should never be taken lightly. Persistent eczema, psoriasis, and skin breakouts are common allergies but not to be taken lightly.

Figure 1.1 illustrates the increased prevalence of food and skin allergies in children. Why is this happening? Why the increase? Maybe we should start regarding skin symptoms as the body's cry for help.

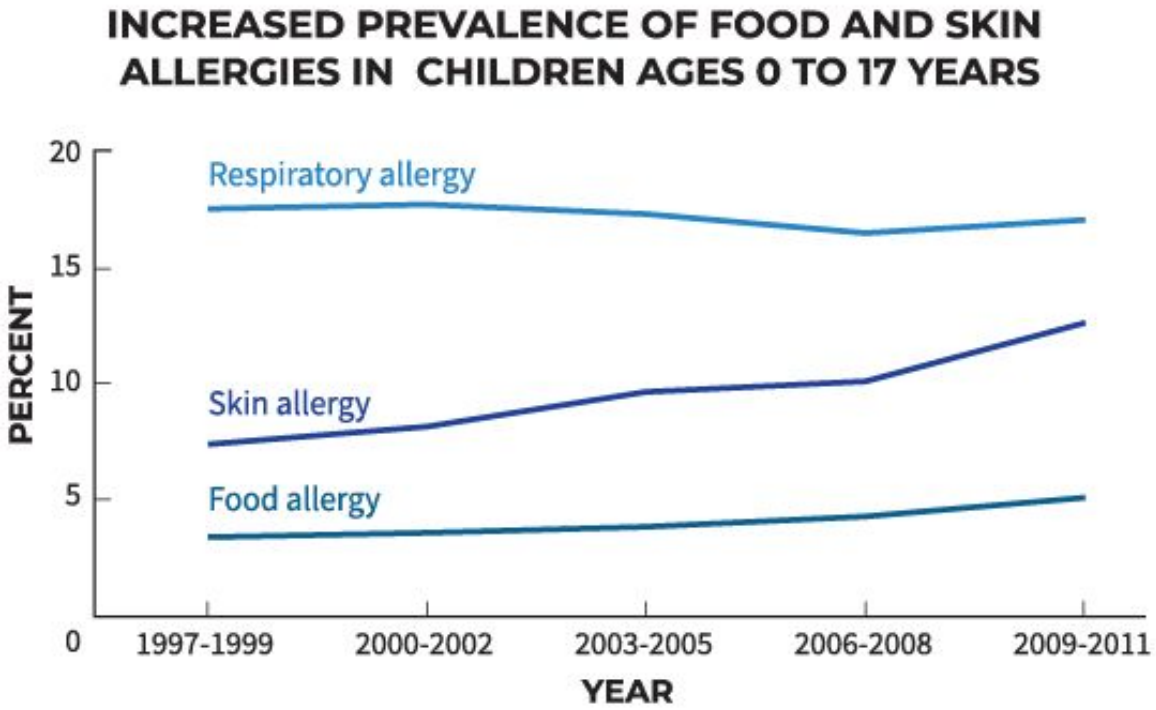

Figure 1.1. Jackson, Kristen D. et al., "Trends in Allergic Conditions Among Children, United States," *NCHS Data Brief*, No. 12, (2013).

Why Identifying Food Reactions Is Important

Many people know that chocolate and onions are toxic to cats and dogs. Toxic. So we don't give toxic foods to our pets. It's simple.

Why is it difficult to apply this logic to our own health and our children's health?

As toxic as they are, small amounts of chocolate and onions won't kill a dog or cat instantaneously or even make them sick right away. Similarly, eating processed foods in moderation does not kill humans. Some people believe that, as long as we don't have a life-threatening allergic reaction to foods, all foods are safe to eat.

On the contrary: certain foods and ingredients are slowly killing you. Sure, you may not die from eating chocolate now, but you may be one bite closer to plant-toxin poisoning (oxalates), type 2 diabetes, gastrointestinal disease and autoimmune illness.

The need to return to real foods is imperative. You know this, but in our fast-paced modern society, where we're accustomed to instant gratification, eating only real foods is not practical. Microwaving a prepared full-course meal is convenient. Getting food delivered is easy. But everything in life has an opportunity cost. Every choice has a consequence. If you choose convenience, you may never experience optimal health. If you choose convenience, you may risk never seeing a day past sixty. You decide, because many physical ailments are caused by food.

Why?

For one, the human body tends to have more bacteria than human cells. When foods break down into their smallest molecular components, it makes sense that they would affect our cells. Anything that is digested will become a friend or a foe. Anything.

The body doesn't read Universal Product Codes and ingredient lists. It understands the smallest breakdown of foods—atoms.

Most processed foods are made in labs, so the body sometimes mistakes the chemical ingredients in food for the body's own cells. The immune system then incorrectly tags the body's cells as invaders and starts attacking the body. This is how many autoimmune disorders begin.

So how do we know foods are causing some of our symptoms?

I'll discuss this more in later chapters, but if you've ever experienced physical and emotional symptoms that seem to have no obvious source, you might just have a food sensitivity. Americans are big fans of self-diagnosis. We may attribute a lot of symptoms to aging. That may be true, but aging probably is not the root cause of those symptoms. In a body that has been fed proper foods, human organs have a lifespan of at least 120 years.[2]

That's why there is no organ donor age limit, according to the Health Resources and Services Administration, an agency of the U.S. Department of Health and Human Services. Yes, even eighty-year-olds have successfully donated organs. Why is it that, in 2019, the average life expectancy in the United States was only 79 years (76 for men, 81 for women)? The United States was behind most developed nations, ranking fifty-third of 228 countries. Yet, when it comes to national wealth (as measured by gross domestic product per capita), the United States is always in the top 5 or 10 percent. As one of the wealthiest nations, Americans should have a longer average life expectancy than the citizens of most countries, but we barely make the top 25 percent.[3]

Clearly, something is wrong.

I dug into why the U.S. life expectancy keeps dropping and found that a big reason is despair, primarily because of drug use, alcohol

use, and suicide. Suicides increased by 24 percent between 1999 and 2014.[4]

As I'm writing this during the COVID-19 pandemic, alcohol sales have jumped more than 50 percent. Unemployment during the Great Depression reached 25 percent, but the pandemic could drive the rate above 32 percent, according to the Federal Reserve Bank of St. Louis.[5]

What does this have to do with nutrition?

If you understand that the body is a collection of atoms, then so too is the brain. Mental health and nutrition are closely related. You must feed the body with nutrient-dense foods to have a fighting chance in this struggle we all call life.

The root of human health lies in the foods consumed. The unavoidable truth is that food can be either medicine or a slow poison. Because it's impossible to identify food sensitivities in any other way, it is necessary to undertake an elimination diet.[6]

What Is an Elimination Diet?

An elimination diet means selectively eating certain foods for a short period of time to pinpoint potential food intolerances. Elimination diets can reveal whether a certain food may be causing physical or mental symptoms or making any symptoms worse. The diet is an effort to eliminate potential allergens that occur naturally in foods while also removing artificial ingredients that can cause toxic effects. By identifying these foods, you can then start the journey to optimal health.

In 1926, Dr. Albert Rowe introduced the elimination diet for addressing food allergies in his book, *Elimination Diets and the*

Patient's Allergies. Although elimination diets are now used mainly to address physical symptoms, early on, the elimination diet was used in connection with mental health issues.

Think of an elimination diet as a means for finding a baseline of foods that help you experience optimal health. This baseline is a combination of foods that allows you to have nearly no adverse physical and emotional symptoms. Once you find your baseline, you can slowly reintroduce suspect foods one at a time. You know how you feel when eating only the foods in your baseline. You'll know if you feel any different when you reintroduce other foods.

Sometimes symptoms will not show up immediately upon reintroduction, which is why most reintroduction protocols recommend adding back one food at a time and including it in at least one meal every day for several successive days. Yes, it's a slow and cumbersome process. At a minimum, I recommend reintroducing foods for one week each. This eliminates much of the guesswork and helps you to put together a personalized list of foods that address your body's needs for achieving optimal health.

Some of you may have tried an elimination diet. While it may have helped somewhat, it probably was not successful at identifying all food sensitivities and ridding you of most physical and mental ailments. This is why it is important to determine what the right foods are for your personalized needs. By undertaking an elimination diet, you are essentially combining the scientific method and the body's wisdom to help determine your body's food sensitivities. In Table 1.2 you can see find some of the most commons signs of food sensitivities.

One caution is that if you have a history of specific foods causing an allergic (IgE) response, do not try to reintroduce these foods. These

foods should be reintroduced only under the care of a trusted practitioner.

Asthma and Cesarean Deliveries

Several population studies have shown the prevalence of allergic diseases in children has been increasing in developed countries since 1990.[7] Let's take a look at asthma.

Asthma

Allergic asthma is asthma that is caused by an allergic reaction. Asthma has increased significantly since the 1970s. Between 1932 and 1950, allergies increased by 10 to 13 percent in New York City. By 1982, asthma was considered the biggest medical problem for children in New York City, and in 1996 asthma was deemed an epidemic there.[8]

What caused the increase in the prevalence of asthma between 1955 and 2000? Among the explanations suggested are:

- Increased use of broad-spectrum antibiotics.
- Greater number of early-childhood vaccinations.
- Use of acetaminophen to treat childhood fevers.
- Less exercise, which has led to an increase in children's average body mass index.

Children need to play outdoors not only to get vitamin D but to increase their exposure to common bacteria.

Table 1.2. Signs of Food Sensitivities.

I'd also add cesarean deliveries (c-sections) to the increased risk of asthma. C-sections increase the risk of asthma in children. A 2009 study suggests that babies born by c-section have impaired cell function because the cells that regulate the development and function of the immune system are suppressed in cesarean babies. And at least 70 percent of the human body's immune system resides in the gut, which is why a healthy gut is crucial for optimal health.[9]

The 2009 study also found that such factors as the stress and labor process, and the exposure to specific microbes through the birth canal, supported a child's immune response. C-section babies miss out on these benefits.

C-sections have nearly doubled worldwide since 2000. According to a 2017 *Consumer Report* study, U.S. cesarean deliveries jumped from 26 percent of all births in 2000 to 32 percent in 2017. One in 3 American babies are now born via c-sections, and 26 percent of these women are low-risk, healthy pregnancies that could deliver vaginally. In Latin America and the Caribbeans, c-sections increased a whopping 44.3 percent.[10]

More women are choosing planned, elective c-sections. The exact number for elected c-sections is uncertain, but according to the 2015 National Vital Statistics Report for Births, it is estimated at about 3 percent.[11] In California, the c-section rate for low-risk deliveries (healthy women with low-risk pregnancies and full-term babies positioned headfirst) is between 12 and 70 percent, depending on the county and hospital.[12]

In 1985, the World Health Organization stated that there was "no justification for any region to have a cesarean section rate higher than 10 to 15 percent." Although some people believe that c-sections reduce maternal and newborn fatality rates, that is simply not true. Twenty years later, the WHO released another statement declaring that at "population level, cesarean section rates higher than 10 percent were not associated with reductions in maternal and newborn mortality rates." (World Health Organization, 2015)[13]

In fact, elective c-sections can increase the risk of death by 60 to 700 percent. A Dutch study found that women undergoing a c-section experience bleeding, uterine rupture, hysterectomy, and

cardiac arrest five times as often as women who deliver vaginally. This risk is higher if a woman undergoes subsequent c-section deliveries.[14] Table 1.3 shows how placenta accreta (abnormal placenta attachment), hysterectomy (removal of the uterus) and maternal morbidity is associated with multiple repeat cesarean deliveries.

CESAREAN DELIVERY	PLACENTA ACCRETA	ODDS RATIO*	HYSTEREC-TOMY	ODDS RATIO*
First⁺	0.2%	--	0.7%	--
Second	0.3%	1.3 (0.7-2.3)	0.4%	0.7 (0.4-0.97)
Third	0.6%	2.4 (1.3-4.3)	0.9%	1.4 (0.9-2.1)
Fourth	2.1%	9.0 (4.8-16.7)	2.4%	3.8 (2.4-6.0)
Fifth	2.3%	9.8 (3.8-25.5)	3.5%	5.6 (2.7-11.6)
Six or more	6.7%	29.8 (11.3-78.7)	9.0%	15.2 (6.9-33.5)

* 95% Confidence Intervals
⁺ Primary Cesarean Delivery

Table 1.3. Silver, RM et al., "Maternal Morbidity Associated with Multiple Repeat Cesarean Deliveries," *Obstet Gynecol*, 107 (2006): 1226-32.

C-sections should never be elective surgery. Vaginal births are far safer than c-sections for women and their babies. In the United States, maternal mortality rates have increased in the last two decades and are considerably higher than in other wealthy countries. It's not unreasonable to suspect that c-sections have a role in the increase in maternal mortality rates.

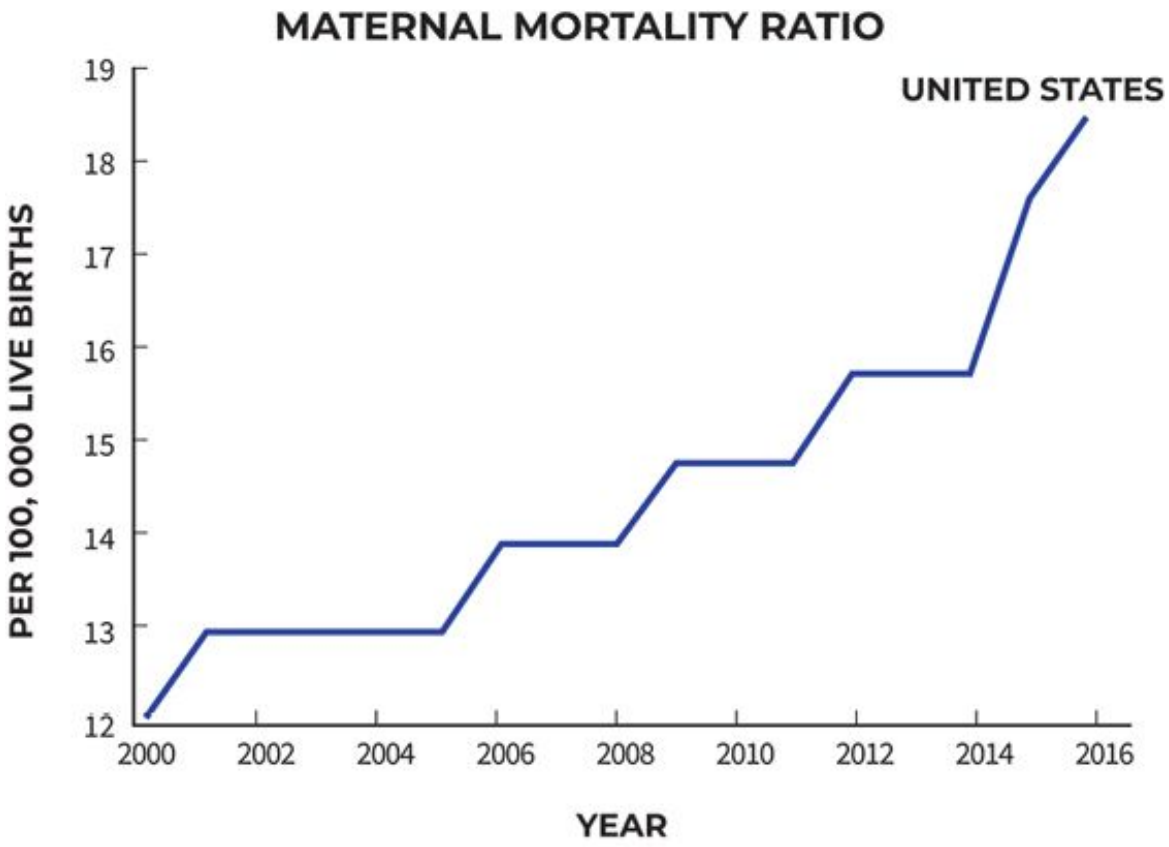

Figure 1.4. WHO, et al., "Trends in Maternal Mortality," Geneva, World Health Organization, (2019).

The U.S. infant mortality rate isn't great either—twice the rate seen in all other developed countries.[15] In Figure 1.5, you can see how poorly the United States fares in infant mortality deaths. We are wealthier than many of these countries, which usually is a measure of access to healthcare, but we are at the bottom of the list.

If you are pregnant or planning to conceive and your OB-GYN recommends a c-section, have your OB-GYN state specifically why you need a c-section. Then get a second opinion. Make sure to check your hospital and OB-GYN for their rates of c-sections. C-sections, unfortunately, add to the bottom line and are a factor as to why they are becoming more commonplace.[16]

If you have undergone a c-section, an elimination diet accompanied by a protocol for providing gut-healing support can have significant health benefits. Some hospitals are starting to do this, but I'd also recommend having microbes from the mom's birth canal put on the baby (as opposed to microbes from the hospital room). Yes, vaginal health on the baby does a baby's body good.

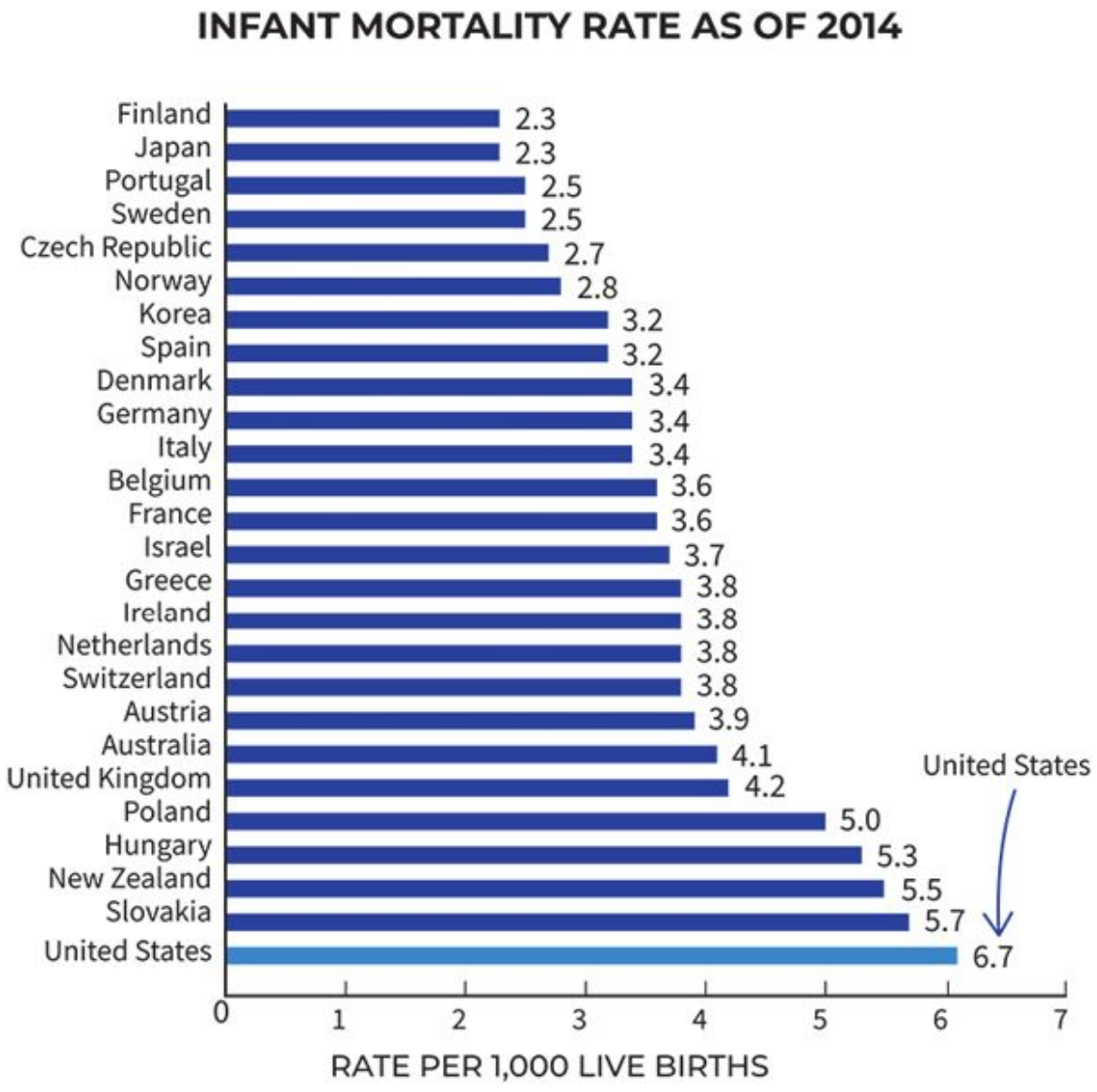

Figure 1.5. CDC "Linked Birth/Infant Death Data Set," CDC, NCHS, (2010).

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Chapter 2

It Starts with the Gut

All disease begins in the gut.

— Hippocrates

THE HUMAN MICROBIOME—the microorganisms that live together in a specific environment—is a large collection of bacteria and microbes that live primarily in the gut. The body typically carries trillions of microbes in the gut, including more than a thousand species of bacteria. These bacteria not only help the body to digest foods, they play a critical role in immune function.[17]

Popular Elimination Diets

If you've tried an elimination diet and it didn't really help, maybe the problem was that you didn't eliminate all the culprit foods. Perhaps your baseline still needed some fine-tuning. I will discuss specific foods in Chapter 15, but for now, I want to review the more popular elimination diets.

All elimination diets provide some relief because they eliminate significant culprits: processed foods, refined foods, and especially inflammatory seed oils (vegetable oils). But when you have gut dysbiosis—an imbalance of excess bad gut bugs—food sensitivities don't disappear by merely removing the guilty food groups. The greatest pitfall in all elimination diets is that they focus on which foods to remove and retain depending on the person's sensitivities, but these diets rarely prioritize nutrient density.[18]

Several elimination diets show that it's possible to use them to start healing and attaining optimal health. But it's clear that no single diet or protocol will work for everyone. The Carnivore Cure elimination diet begins with only the most essential foods and is more restrictive than the popular elimination diets. But it just might be the missing link that allows people suffering from food sensitivities to get one step closer to optimal health.

I am in no way trying to devalue the efficacy of the elimination diets I discuss. Still, some people may find these diets are not ideal because their lists of sanctioned foods may include one or two that adversely affect some people.[19]

The goal of all elimination diets is the same: to help people figure out their own food sensitivities.

I touch upon antinutrients several times in this section; I address them in detail in Chapter 6. For now, all you need to know is that antinutrients come from plants (chemical toxins in their DNA), which use them to protect themselves and their seedlings.

Autoimmune Paleo Diet

The autoimmune paleo diet is based on the ideas of a gastroenterologist, Dr. Walter Voegtlin. Voegtlin believed modern humans should follow the diet of a Paleolithic human. The diet was popularized in 2002 by Loren Cordain, an American scientist who specialized in nutrition and exercise physiology.

The autoimmune paleo elimination diet is a more restrictive version of the paleo diet. The elimination version recommends limiting natural sugars, coconut, fruits, high-glycemic vegetables and saturated fats. It focuses on reducing inflammation in the body in

order to ease symptoms of autoimmune disease, a result of an overreactive immune system.

Eating like the Paleolithic human is smart. It bans most processed foods, refined foods, and inflammatory seed oils. While recommending the consumption of limited amounts, the diet still allows all nuts, seeds, and vegetables. The diet does not prescribe how to prepare vegetables and other foods for optimal digestion. The diet also allows some legumes, specifically, snap peas, string beans, and green beans.

Autoimmune paleo allows for natural sweeteners and fruits, although the paleo diet for those with autoimmune disease recommends less consumption of natural sweeteners and fruits. Many people use fruit—and too much of it—to satisfy their cravings for sweet, processed food. If we eat like the Paleolithic human, we shouldn't be consuming nuts and fruits daily. Berries and nuts were hard to come by and not available year-round, only locally and seasonally.

While it is better to swap processed sugars for natural ones, consuming two green juice smoothie blends daily is not ideal. They contain too much sugar, as well as an awful lot of antinutrients that could be harming your body (especially if your green juice consists of spinach, almonds, and cocoa powder). In Chapters 4, 6, and 14, I'll explain how to tightly regulate your blood glucose numbers, as well as how certain foods are higher in antinutrients.

FODMAP

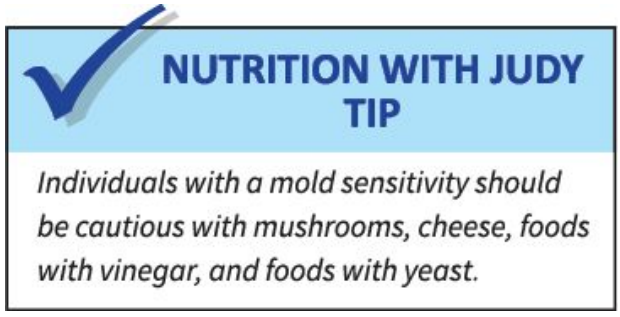
A diet low in fermentable oligosaccharides, disaccharides, monosaccharides, and polysaccharides (FODMAP) essentially eliminates simple carbohydrates.

In the 1990s, a Melbourne dietitian, Sue Shepherd, used a diet that banned all fruit for patients struggling with irritable bowel syndrome.

By the early 2000s, Shepherd and researchers at Monash University were researching all fermentable sugars and later published studies showing FODMAP's efficacy at eliminating triggers for irritable bowel syndrome.

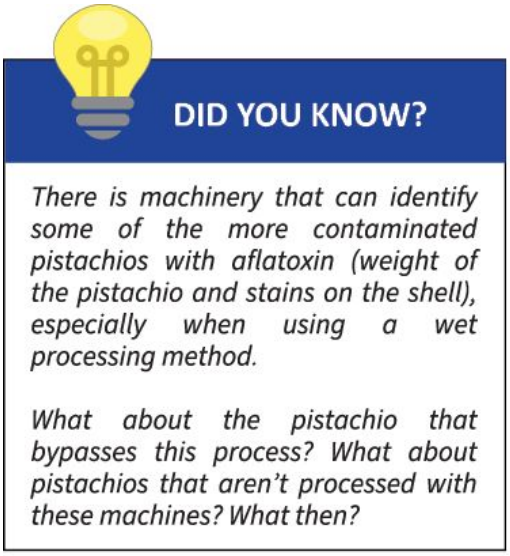
This diet protocol is now a tool for alleviating digestive symptoms that may include irritable bowel syndrome, small intestinal bacterial overgrowth, and other gastrointestinal disorders. The lower a food is on the FODMAP list—such as chives, unripe bananas, and kale—the better the food is for people on this diet. Foods high on the FODMAP list—such as garlic, onions, apples, and asparagus—are restricted.

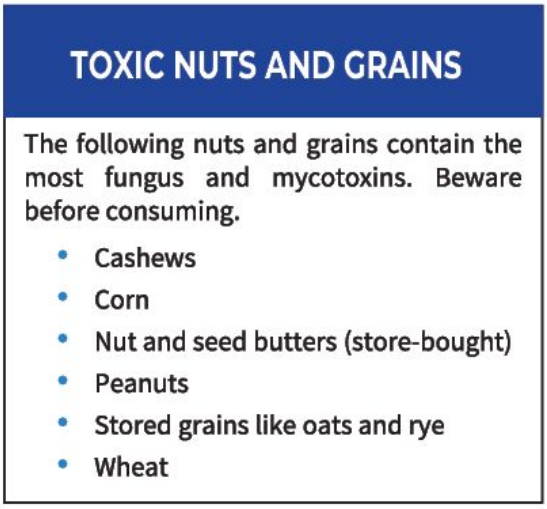
Like many of the elimination diets, the FODMAP diet doesn't consider antinutrients. It allows spinach and swiss chard, although they are high in oxalates, a natural substance that locks onto calcium during digestion. High-oxalate foods include tubers (potatoes) and nightshades (tomatoes and eggplant), all of which are permitted on a FODMAP elimination diet. Some people also cannot tolerate these foods because of their lectin content, another type of antinutrient. Tubers and nightshades with their lectin and oxalate content can cause digestive issues.



Peanuts are low on the FODMAP list, meaning they are permitted, but peanuts are not ideal for human consumption. Peanuts contain lectins, which can contribute to autoimmune and digestive problems, as well as leaky gut syndrome.[20] Peanuts also contain oxalates and

phytic acid, another antinutrient that also binds to nutrients.[21] If these nutrient-dense plant-based foods bind to nutrients so that the body cannot absorb them, what benefit do you realize by consuming nutrient-rich, but absorption-poor foods?





Peanuts contain aspergillus mold, called aflatoxins, and toxic chemical components because of the way they are harvested. Aflatoxins are considered a human carcinogen as they've been found to cause cancer in humans and animals. When crops are raised in warm temperatures with high moisture and high humidity, mold growth and toxins are inevitable.[22] When you consume peanuts, they can pass the intestinal wall and absorb into the bloodstream causing autoimmune illness, as well as overgrowth of yeast or mold toxicity in the body. When you consume these molds and chemical toxins daily, adverse physical and mental symptoms are bound to occur.

You can soak nuts and clean them with food-grade hydrogen peroxide to remove some of these antinutrients, but personally, for me, that's just a little too much effort.

Gut and Psychology Syndrome Diet

The elimination diet for gut and psychology syndrome (GAPS), commonly used for leaky gut, microorganism imbalances in the gut, and nutrient deficiencies, was devised by Dr. Natasha Campbell-McBride, a neurosurgeon from Russia, to ameliorate her son's autism.

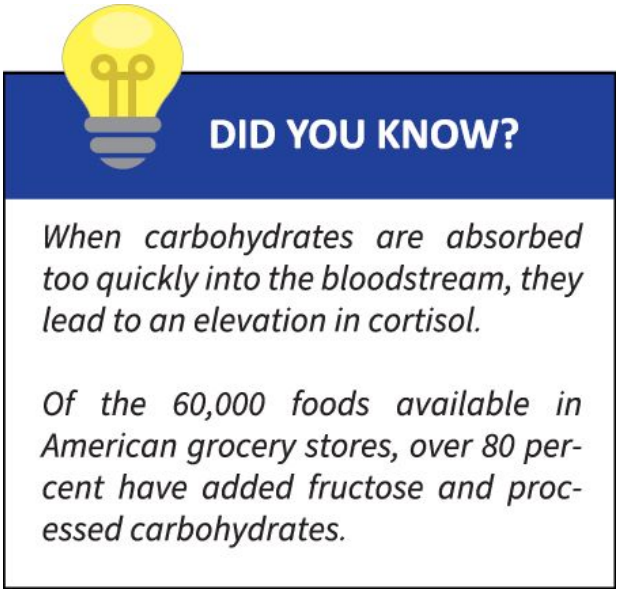
The GAPS elimination diet focuses on healing the gastrointestinal system and strengthening a weakened immune system. GAPS is one of the few elimination diets that focus squarely on nutrient density in foods.

The GAPS diet has several stages. The first of six stages is the most restrictive, and each subsequent stage becomes more flexible until the body normalizes with the disappearance of physical symptoms. Undertaking the full GAPS diet can take about two years.

Once their gut heals, the GAPS dieter can reintroduce raw vegetables and GAPS-compliant baked breads. The first stage permits fermented juices. Recent findings show that people with fungal or bacterial overgrowth in the body—such as candida—should temporarily avoid fermented prebiotic foods and juices. Foods like kimchi, sauerkraut, and kefir produced from a fermenting process, can feed opportunistic yeast and facilitate bacterial overgrowth. Prebiotics feed all bacteria and yeast, not just the good ones. This may be happening if you feel digestive discomfort after consuming these foods.[23]

Glycemic Index

The glycemic index was the brainchild of Dr. Thomas Wolever and Dr. David Jenkins, both professors of medicine and nutritional sciences at the University of Toronto. In 1981, they found a way to measure how quickly a carbohydrate raises blood sugar levels.



The glycemic index essentially gives a rating to each food that describes how it affects the body's glucose levels. The lower the glycemic index number, the less the specific food raises the body's blood sugar levels. Some foods that are high on the glycemic index are refined grains and flours, sweetened beverages, dried fruits, sugar, and starchy root vegetables. Foods that are high in carbohydrates quickly raise blood sugar levels.

Removing sugar—all sugar—from the human diet is advisable. Humans consume too much sugar. When introduced in the 1600s, processed sugar was considered a luxury for the wealthy. As the cost of producing sugar dropped, and corn syrup and high-fructose corn syrup were introduced, sugar consumption skyrocketed. As Gary Taubes, an American journalist and low-carbohydrate diet advocate, discusses in *The Case Against Sugar* (2016), subsidies paid to corn growers by the U.S. government have made corn syrup almost free to grow and is the main reason why cheap processed foods all contain corn syrup. Figure 2.1 shows U.S corn subsidies totaling $113.9 billion. These days the average person consumes 150 to 200 pounds of sugar annually. If some people consume no sugar, the average consumption is even higher. In fact, the average

person consumes about 300 percent more sugar than the daily recommended value.[24]

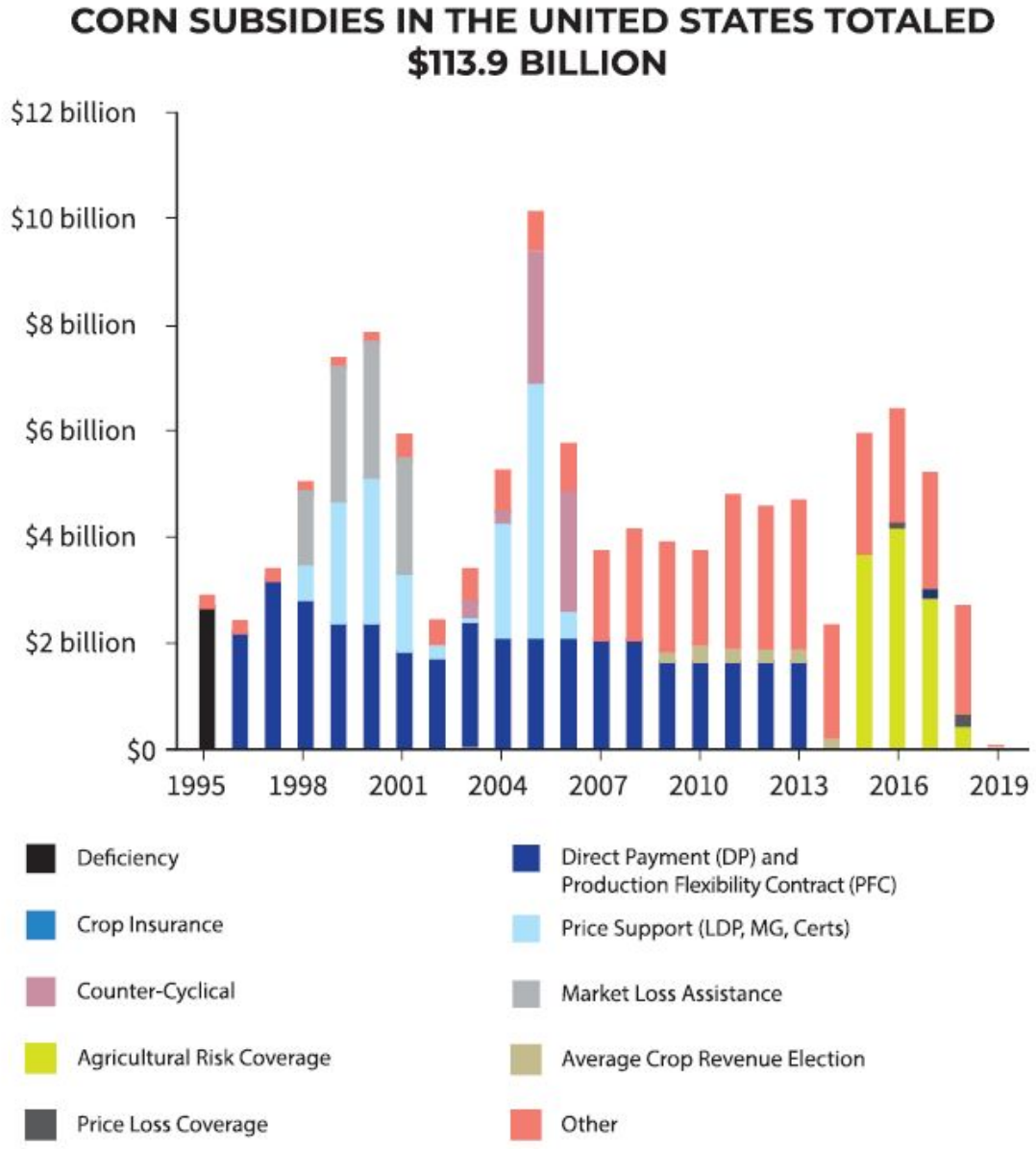


Figure 2.1. EWG Farm Subsidy Database, "Corn Subsidies in the United States Totaled $113.9 Billion from 1995-2019," EWG, (2020).

As the glycemic index is pegged to servings of 50 grams or about 1.75 ounces, the rankings sometimes are unrealistic in terms of typically consumed portions. We may not eat 50 grams of glucose in

a meal—as even table sugar is part glucose and part fructose—but we often eat over 50 grams of sweet potato in a sitting. Sweet potato is a lower glycemic index food at 50-gram servings, but it may not be at 100-gram servings or 3.5 ounces. One medium-sized sweet potato is over 100 grams. Additionally, the glycemic index considers only the consumption of one food at a time and does not consider the specific needs of individual bodies and overall metabolic flexibility. When broken down by the body, glucose differs from fructose, even if both are labeled sugar.[25]

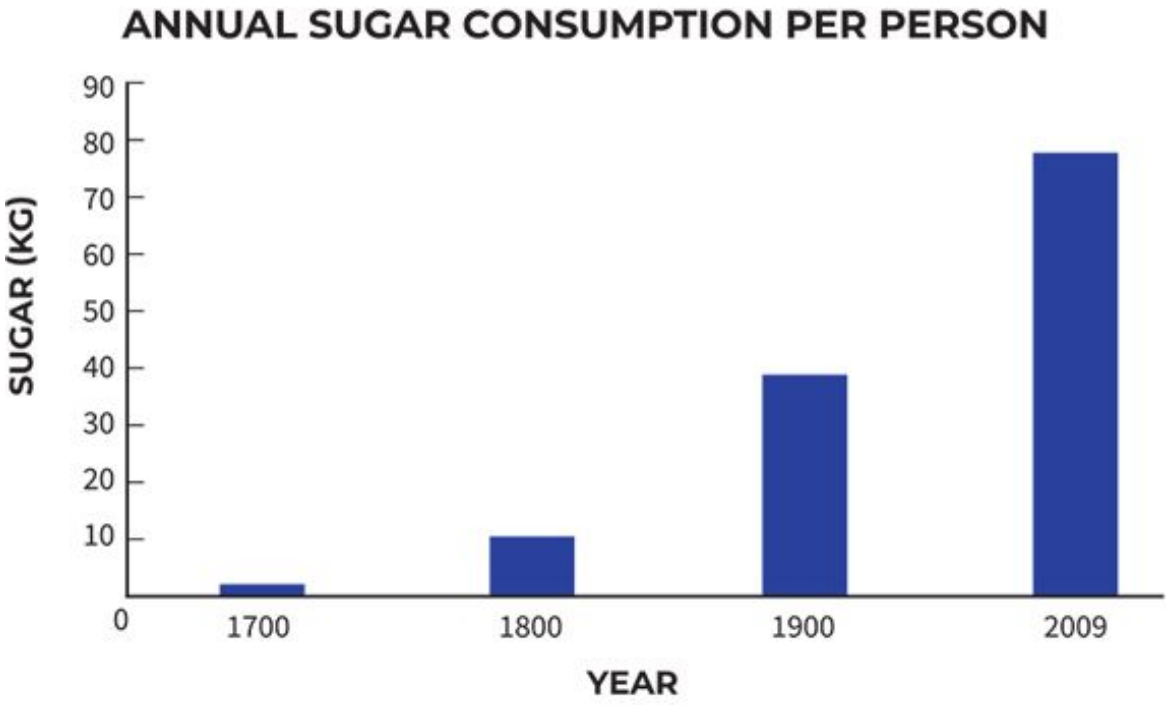


Figure 2.2. Statista, "Annual Sugar Consumption Per Person Through History," Statista Research Department, (2016).

Although it recognizes sugar overload is a problem, the glycemic index recommends foods high in antinutrients such as nuts and seeds, beans and legumes, grains, and leafy greens. While these foods aren't high in carbohydrates, they are high in antinutrients.

The Low Histamine Diet

Histamine intolerance is essentially an excess of histamines in the body because of the body's inability to breakdown histamines. Intolerance also can occur as a result of an allergic response that produces too many histamines, manifesting as headaches, sinus congestion, hives, and gut issues. Histamines release from the body allergens that the immune system has tagged as a threat. Genetics may play a role in an overreactive histamine response, but histamine intolerance often stems from gut imbalances caused by an impaired enzyme function called diamine oxidase (DAO).[26] In Table 2.3, you can see more information on histamines and histamine-rich foods.

HISTAMINES

Symptoms of a histamine reaction can be mild or severe and can lead to asthmatic issues, skin issues such as hives, and migraine headaches. Fortunately, you can begin to test the foods that you're eating to see how you react. Just because a specific food is on this list, it doesn't mean that you will react.

COMMON HISTAMINE CAUSING FOODS

- Aged cheeses
- Alcohol
- Avocados
- Bananas
- Canned foods
- Chocolate
- Ciders
- Dry aged meats
- Eggplant
- Eggs
- Fermented food and drink
- Fish (Histidine)
- Milk
- MSG
- Nuts
- Papaya
- Pineapple
- Preserves and jams
- Processed meats and pork
- Sauerkraut
- Shellfish
- Sour cream
- Spinach
- Strawberries
- Tomatoes
- Vermouth
- Yeasts
- Yogurt

HISTAMINE INTOLERANCE REACTIONS

- Abdominal pain, gas and cramps
- Allergy-like symptoms
- Asthma
- Bloat and swelling
- Changes in blood pressure
- Facial flushing
- Headache on the back or top of the head
- Hives or a developing of rashes
- Insomnia
- Migraine headache
- Nose has excess mucus
- Pulse rate increases
- Sinus pressure
- Sinuses get congested
- Throat itchy or closing up
- Tightness in chest

Table 2.3. Histamines

DID YOU KNOW?

As histamine intolerance is oftentimes related to gut dysbiosis, be wary of probiotics that include prebiotics as they can also feed opportunistic bad bugs.

NUTRITION WITH JUDY TIP

While organ meat is nutrient-dense, organ meat is typically higher in histamines. This is why some individuals have sensitivities to desiccated organ supplements.

Kidney and thyroid meats may be the safest organs to try.

Oftentimes, healing the gut correlates with the lessening of histamine intolerance and its subsequent symptoms. Studies have shown that probiotic use can counter histamine intolerance.[27] Histamine intolerance is more of a symptom of a problem than its root cause. What is causing the body to release too much histamine? What is causing histamine to linger in the body and cause severe reactions? Is it genetics, mast cell dysfunction, impaired enzyme function (DAO deficiency), environment, the gut, food, or all these?

Many foods permitted on a low-histamine diet include antinutrients such as quinoa, corn, and amaranth. A low-histamine diet focuses on removing high-histamine foods but does not focus on nutrient density or removing foods high in antinutrients.

Traditional Diets

Traditional diet advocates focus on preparing and eating foods the way our ancestors ate before processed foods. Most traditional diet advocates are big proponents of dairy, specifically raw milk and kefir. While most traditional diets may have consumed dairy, not everyone can today—not even raw milk.[28] The diet also allows for raw vegetables and fruits. Often raw foods are difficult to break down for the human digestive process.[29] As Konstantin Monastrsky discusses

in the *Fiber Menace* (2008), the high fiber content of raw fruits and vegetables can cause bloating, stomach cramps, and flatulence.

Additionally, these traditional diets permit other vegetables, legumes, and nuts as long as they are properly soaked, sprouted, and prepared. The thought is that the proper preparation removes most antinutrients, and thus these foods can be easier on digestion. Yes, the proper preparation of cleaning, soaking, and cooking is ideal, but some antinutrients cannot be removed.[30]

Whole30

The Whole30 elimination diet program was formulated by Melissa Hartwig, a certified sports nutritionist. This diet eliminates not only processed foods but also processed ingredients. The goal is for dieters to find their healing baseline in thirty days. The value of Whole30 lies in its protocol, which describes a specific mindset and behavioral changes. Whole30 sets the dieter up for success with preparation before embarking on the diet. Technically, the diet lasts longer than thirty days, given the days of preparation and the period of reintroduction after thirty days.

Whole30 recommends limiting certain nuts but allows them. The diet also allows for most fruits and vegetables. Whole30 has a FODMAP-compliant list that can improve gut health, but some problem foods remain, such as spinach (oxalates) and squash (lectins).[31]

Most of these diets and protocols are great ways to find the foods you should eat to attain optimal health. But all these protocols have one thing in common: they include most fruits and vegetables.

But what if the real culprit *is* plant-based foods? No elimination diet rules out plant foods.

Until now.

What Is It About Food?

When food breaks down into atoms, some foods can have a toxic or inflammatory effect on the body. Bodies with gut impairments are more susceptible to these toxic effects. Once true gut healing occurs, you may find that you are less sensitive to foods that previously caused difficulties.

This is why healing your gut must be your top priority. You must heal the gut to find the root cause of most disease. By eliminating food sensitivities, you can get closer to optimal health. I never recommend reintroducing foods until the gut is healed. Otherwise, you will be moving two steps forward and three steps back.

I've already mentioned that food allergy tests aren't always accurate because they look at only a snapshot in time. Immunoglobin tests come with a disclaimer: if you eliminate a particular type of food before the test, it will be difficult for the test to measure any sensitivities to it. If genetically modified foods (GMO) carry genes from different foods, how can the test identify which food has the problem protein? One study showed soybeans genetically modified with Brazil nut proteins caused allergic responses in the soybeans. Yes, you can transfer allergens by modifying genes. Although some studies debunked the connection, these studies were funded by Monsanto, one of the largest players in genetically modified seeds and foods.[32]

Strawberries freeze easily, and any early frost can ruin the yield of strawberry crops. Peanuts have a gene that prevents the plant from freezing, but this gene is also related to severe protein allergies in peanuts. This peanut gene is sometimes used to genetically modify strawberries to withstand freezing temperatures.[33] Someone allergic to peanuts can have an allergic response to these strawberries.

Because of this problem, GMO scientists have researched doing a similar gene swap (anti-freeze proteins) with Arctic flounder. But this fish gene swap has been less embraced, as in this case, the problem is not allergies (except for people allergic to fish), but the moral dilemma for vegans and vegetarians.[34] With these genetically modified foods, is it any wonder we have increasing rates of food allergies?

Digestion

The human colon is about five feet long (1.5 meters) and has more than a hundred trillion microorganisms. Four thousand or so species have roles and places in the colon.[35]

Ever since the completion of the Human Genome Project, which decoded every human gene, it has been possible to identify the dead microbes in our stool. The gut is the biggest organ for nutrient absorption, toxin detoxification, and waste elimination. Continually consuming foods that the gut needs to detoxify causes the body's whole system to work less efficiently. The processed and refined foods in the standard American diet can clog up this system and eventually cause it to break down. The result is a weakened system that makes the body feel tired, depressed, sick, and mentally foggy.

The digestive system begins when the brain signals for salivation and ends with bowel movements. In addition to being responsible for the breakdown and absorption of nutrients, the digestive system eliminates waste and toxins from the body. It also houses most of the body's immune cells. No wonder people with poor digestive health are sicker than ever before.

Healthy digestion is fundamental to optimal nutrition. Eating a nutrient-dense, whole foods diet is essential. But the body must also be able to mechanically and chemically break down the foods and

absorb their nutrients. Proper digestion provides the nutrients that fuel and build every cell in the body.

How Digestion Works

To understand why gut health must take priority, it is necessary to understand the basic anatomy and physiology of the digestive process. If you understand it, you may just be more mindful of what you eat.

These days, we are always stressed, with our fight-or-flight reactions activated several times a day. But to digest food properly, we need to be in a state of rest and relaxation. We need to relax while we eat or our digestive system will make its unhappiness known.

pH VALUES OF THE HUMAN BODY

Bodily fluids and pH levels differ in the body. Recently, there has been a popular trend of alkaline waters. These marketing gimmicks share that these alkaline waters will neutralize our modern-day acidic blood levels. Be wary. The body has its own levers to tightly control the pH levels of fluids in the body—your life depends on it. Eat real foods and your body will properly regulate the pH values in the body.

We also need our stomach to be as acidic as possible when digesting foods. Oftentimes, we drink these alkaline waters with meals.

BODILY FLUIDS	OPTIMAL PH	NOTE
Bile	• 7.8	• 97 – 98% water
Blood	• 7.35 – 7.45	• Controlled by the body
Bone	• 7.4	
Brain	• 7.1	
Heart	• 7.0 – 7.45	
Intestines	• 7.5 – 8.5	• Ideal with alkaline pH
Liver	• 7.2	• Alkaline pH helps cleanse blood
Lungs	• 7.38 – 7.42	• Regulates blood pH by releasing CO_2
Saliva	• 6.35 – 7.5	• 99.5% water
Skeletal muscle	• 6.9 – 7.2	
Skin	• 6.2 – 7.5	
Stomach acid	• 1.0 – 3.5	• May increase with alkaline water by 0.5 pH for half an hour
Urine	• 4.8 – 8.0	• Alkalinity reduces the kidney's burden

Table 2.4. pH Values of the Human Body.

You can do this by taking a moment to slow down. Make time for your meals and sit down to eat. Try not to eat while watching television, sitting at your desk, or while standing. Multitasking can cause you to overeat, and, more importantly, it does not provide the proper cues to your brain about the foods you are eating.

The key is to slow down and properly chew your food so that the brain gets the message that you're eating. If the brain does not trigger the proper digestive processes for the foods you're eating, it also will not trigger the production of saliva. This is why you salivate when you see and smell food, but when you're trying to swallow a pill, you reach for a glass of water. This is also why chewing each bite of food twenty to thirty times is ideal: you need to begin the digestive process by breaking the foods down in your mouth, with your saliva providing sufficient moisture to allow you to swallow the foods. You shouldn't be drinking a lot of water during meals because it will dilute your stomach acid and disrupt your ability to break down foods.

Saliva is 99.5 percent water and 0.5 percent solutes of other elements. One solute (salivary amylase) begins the breakdown of carbohydrates in the mouth. Without sufficient saliva, another digestive enzyme (pancreatic amylase) cannot complete the breakdown of carbohydrates later in the small intestine. Over time these undigested carbohydrates enter the gut and create an excess of yeast and other harmful organisms that thrive on undigested carbohydrates (candida).

Figure 2.5 and Figure 2.6 depict the complexity and roles of the digestive process. You don't have to know the details but you can see that if one component breaks down, the digestive process will break.

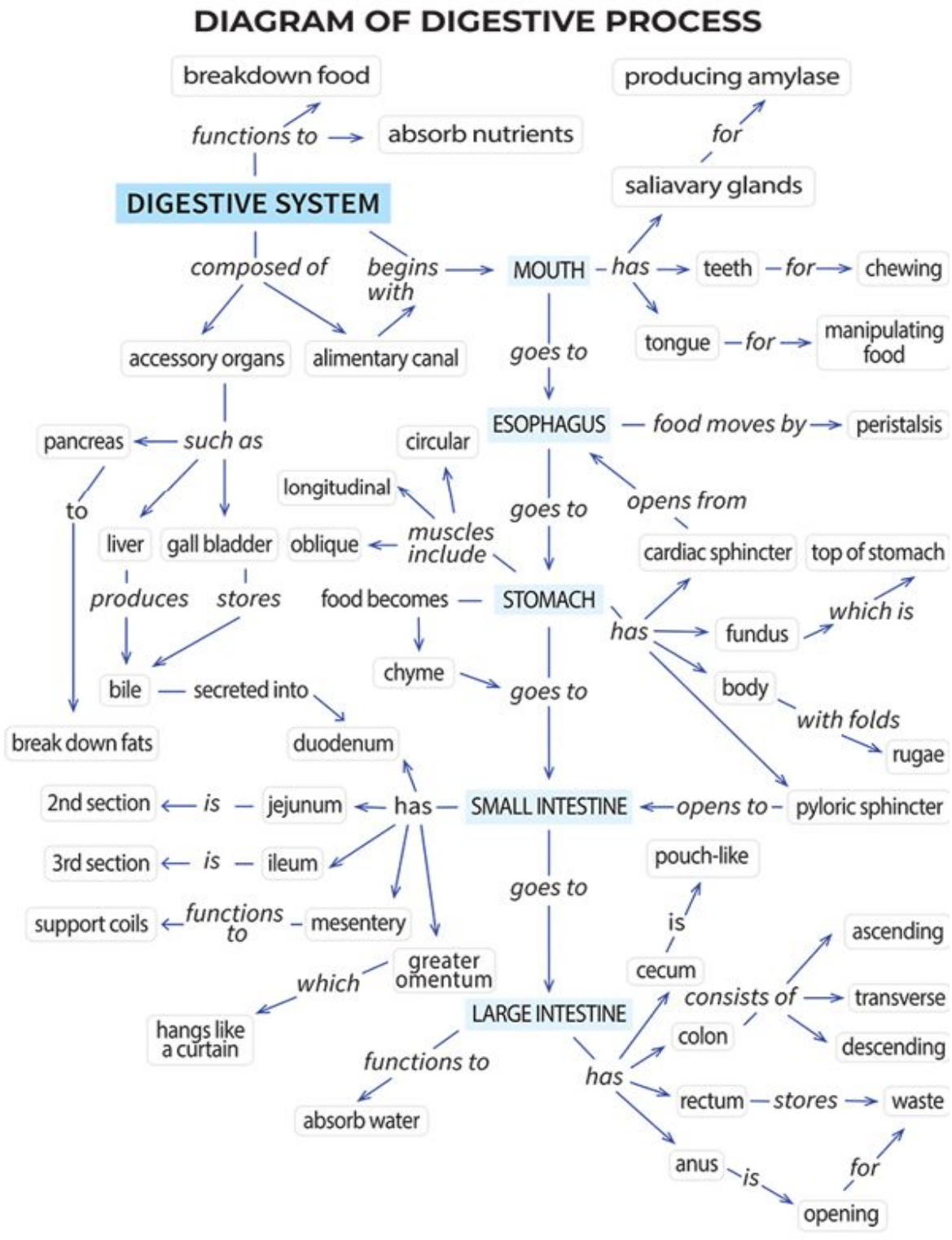


Figure 2.5. Diagram of Digestive Process.

When you swallow, the food enters the esophagus en route to the stomach. The lower esophagus sphincter at the bottom of the esophagus opens to allow the food to pass into the stomach. The stomach continues the breakdown of food, and millions of glands in the stomach's mucosal lining secrete gastric juice or stomach acid. Stomach acid includes mucus, pepsin (the stomach's digestive enzyme), and hydrochloric acid. If the pH of the stomach is not between 1.5 and 3.0, the digestive process goes further off the rails. So beware of alkaline waters, which have become popular lately and guarantee a water pH of 9.0. How do these alkaline waters manage the right pH levels for the varying bodily pH levels?

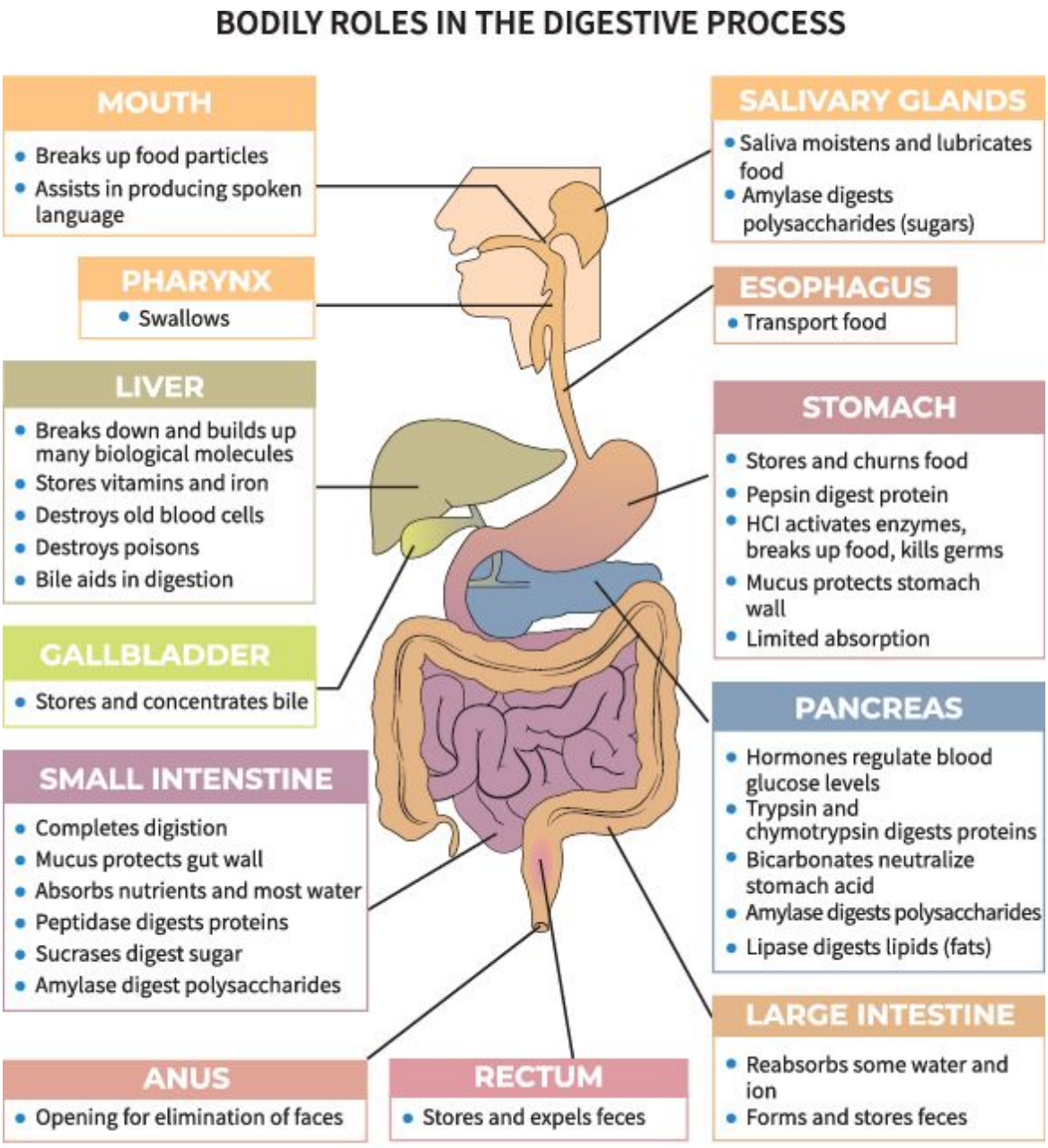


Figure 2.6. Bodily Roles in the Digestive Process.

With an imbalance in the stomach acid, every part of the digestive cascade can break down. Dysfunction can be expressed as belching after a meal, bloating, sleepiness, constipation, loose stools, and gas. Again, while this may be common, it doesn't mean it's normal.

Acid Reflux Disease

If you have ever had acid reflux, the symptom is heartburn, and you know how much it burns. Many people pop acid neutralizers, use an over-the-counter or prescription-strength proton pump inhibitor or histamine H_2-receptor blockers to extinguish the burn. These medications relieve the symptoms of acid in the esophagus. But excess stomach acid is not the cause of reflux. As Jonathon Wright, M.D. discusses in *Why Stomach Acid Is Good for You,* any amount of acid in the wrong place, such as the esophagus, causes burning symptoms and tissue damage.[36]

The body has a muscle-like door that swings open and closed between the esophagus and the stomach. This door, the lower esophageal sphincter (LES), swings open for food, belching, and vomiting. Otherwise, this door remains closed, to keep stomach acid in the stomach and not up the esophagus.

When the body has reflux, the LES door opens, perhaps for only a split second, but some of the stomach acid makes its way into the esophagus. Any amount of stomach acid will cause acid reflux, or heartburn. Stomach acid is never supposed to be in the esophagus. You don't get heartburn because you have too much stomach acid. You get heartburn because the acid is in the wrong place. The accidental LES door opening (causing acid reflux) is usually because of *insufficient* amounts of stomach acid. In Table 2.7, you can learn about foods that cause the LES to breakdown.

WHAT CAUSES THE LOWER ESOPHAGEAL SPHINCTER TO MALFUNCTION?

Some foods overly relax the lower esophageal sphincter (LES). Another reason is wear and tear. When we overeat and eat foods that are harmful to our body, it causes the sphincter to wear and tear faster. When we inundate our stomach with too much food or too many harmful foods, our LES has to work harder for reflux not to occur. As with any other muscle, overuse will cause weakening and degeneration over time. Stress can also be a culprit.

FOODS ARE THE LARGEST CULPRIT

- The causes of GERD include the types of food you eat, how often you eat (portion-size and frequency) and how late you eat.
- Common food culprits are: peppermint, chocolate, citrus fruits, juice, tomatoes, garlic, onions, spicy and fried foods.
- Some studies show that alcohol (particularly red wine) coffee and caffeinated drinks, including tea and soda cause heartburn.
- Other culprits include beta-agonist medications, nitrates in foods, calcium channel blockers, hormone support (progesterone) and nicotine.

FOOD THAT CAN CAUSE THE LES TO MALFUNCTION

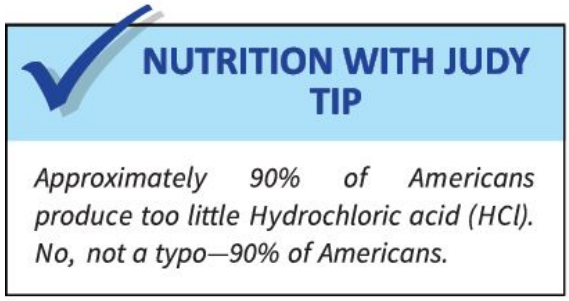
- Carbonated drinks cause distension of the stomach (bloating) which increases pressure on the LES causing acid reflux.
- Chocolate contains a chemical called methylxanthine from the cocoa tree. It relaxes the LES, which causes acid reflux.
- Coffee (with or without caffeine) and caffeinated beverages relax the LES.
- Greasy, spicy or fried foods relax the LES, as well as delay stomach emptying.
- Tomatoes and tomato-based products such as tomato juice, pasta and pizza sauces are highly acidic and cause acid reflux.
- Peppermint, garlic, and onions overly relax the LES.

Table 2.7. Causes of Lower Esophageal Sphincter Malfunction.

Your stomach acid needs to be 100,000 times stronger than the acidity of your blood. That is how it breaks down and prepares the

small intestine to absorb nutrients from foods like steaks.

At the bottom of the stomach is another door, the pyloric sphincter. This door separates the stomach from the small intestine and is narrow. It never opens more than about two or three millimeters, so your food must be broken down to millimeter-sized pieces. (A millimeter is the thickness of a credit card; the tip of a new crayon is two millimeters.)



FACTORS THAT CAN INHIBIT HCL PRODUCTION

- Allergies
- Excess alcohol consumption
- Excess carbohydrate consumption
- Medication (antibiotics and acid-suppressing drugs)
- Nutrient deficiencies

The stomach has to contract to push food down the pyloric sphincter and into the small intestine. The lower esophageal sphincter has to be able to remain closed against this pressure. But it often is weak, and the increasing pressure causes it to open, allowing acid to move into the esophagus. Also, as much as 40 percent of acid reflux can be caused by the stomach's struggle to empty itself properly. The pressure rises from the stomach into the esophagus instead of down the stomach and into the intestines.

If you struggle with delayed gastric emptying—food stays in your stomach longer than it should, leading to bloating, vomiting, belly pain, acid reflux, or nausea—eating just one meal a day should not be an option. In fact, one meal a day is not ideal for most people. Having too much food at once can break down the digestive process over time. A broken-down digestive process means less nutrient

assimilation and absorption and greater chances of disease in the body.

Food needs to enter the small intestine at an acidity of pH 1.5 to 3.0. This acidity level then triggers the small intestine to release a hormone (secretin). When the food's pH is not acidic enough, the small intestine releases less secretin, and the pancreas, in turn, will release less sodium bicarbonate and pancreatic juice enzymes, both of which are crucial digestive supports.

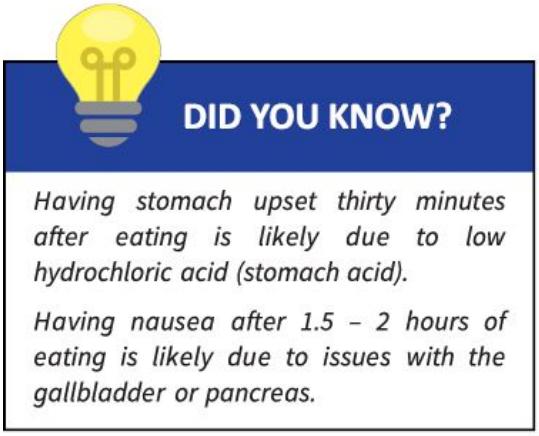
Sodium bicarbonate raises the pH of the food to neutral (7.0) in the small intestine to complete the digestion of carbohydrates, proteins, and fats. If the pH of the food in the small intestine is not neutralized, the small intestine will eventually break down. And without sufficient pancreatic enzymes, the body will absorb fewer nutrients—no matter how high quality their source. These putrefying foods travel into the colon and cause gas, bloat, irritable bowel syndrome, and other intestinal issues.

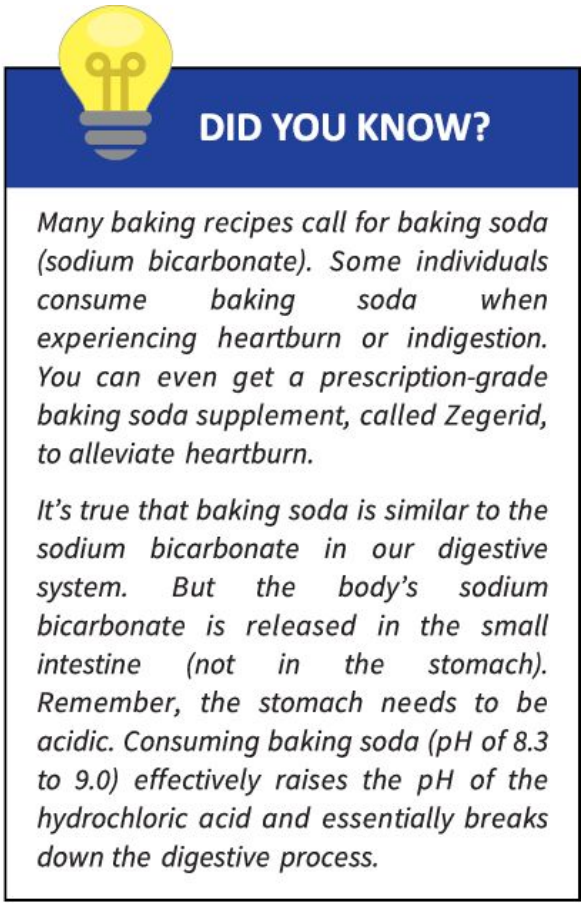
In the small intestine, the hormone cholecystokinin is released along with secretin. Cholecystokinin stimulates the gallbladder to release bile, which is essential for proper digestion: it emulsifies and absorbs fats. Bad fats and foods low in fat disrupt this cascade and cause the bile to get old and viscous. The gallbladder cannot release viscous bile. And without bile, you cannot absorb fats. (If your gallbladder has been removed, your liver learns to make more bile.) One sign of sludgy or viscous bile and a slow functioning gallbladder is having oily stools when eating a high-fat diet. Undigested fat causes issues in the colon, stresses out the liver (your main detoxifying organ) and then leaves you with a deficiency in fatty acids, which are used to produce essential hormones such as thyroid and sex hormones. Similarly, if you've been on a low-fat diet or consuming only seed oils for a long time, you may not be absorbing your fats.

As the digestive system malfunctions, some food eventually escapes from the gut lining and from the no-longer-tight junctions in the small intestine (leaky gut) and causes inflammation. This can cause allergies and, even worse, an autoimmune disease. The food that should have provided the body with nutrients is now causing a direct assault on the immune system.

And the large intestine? When undigested (rotting) foods and undigested fats try to pass into the colon, the ileocecal valve, a door from the small intestine to the large intestine, can get clogged or jammed open. Over time, the ileocecal valve begins to lose its regulatory abilities. These undigested foods break down the colon, causing dysbiosis, and disrupt the healthy microbiome. Without a healthy microbiome, the body does not produce nutrients for the gut (butyric acid), and their absence weakens the cells of the colon. It can cause inflammation, diverticula, and loss of colon function, which ultimately leads to such problems as irritable bowel syndrome, Crohn's disease, and colitis.[37]

The digestive process requires a cascade of events to work together in synchrony. One misstep and over time, the body will begin to break down.





Acid Reflux Medication

When stomach acid is simply in the wrong place, people often reach for a medication that lowers the overall pH of the stomach. But it's a dangerous quick fix.

Over-the-counter antacids like Mylanta, Rolaids, and Tums are acid reducers. Occasional use may help with reducing heartburn. Long-term usage can elevate blood pH levels, cause excess calcium in the blood, and even lead to kidney failure (milk-alkali syndrome). This syndrome is most prevalent in antacid users who also drink milk.[38] If you take Tums to supplement your calcium intake, please stop now. The calcium from Tums is poorly absorbed, and you are neutralizing your stomach acidity.[39]

Consuming milk of magnesia and baking soda is not a good idea. Some people add baking soda to their electrolyte drinks, especially when doing a long fast. When the body is fasting to heal gut health, baking soda is counterproductive. Although you may be lowering your insulin level temporarily, you are not allowing your gut to realize the full healing effects of fasting because baking soda and milk of magnesia can increase the stomach's pH levels. Remember, stomach acid needs a pH of 1.5 to 3.0. Baking soda has a pH of 8.3 to 9.

Many people find antacids are insufficient to counter acid reflux and move to stronger acid-removing medications like histamine H_2-receptor blockers and proton pump inhibitors. Histamine blockers reduce acid levels by blocking the process that leads to acid secretion. When histamine reception is blocked, it signals acid-producing cells to stop secreting hydrochloric acid, our stomach acid. Remember, without stomach acid, the digestive cascade breaks down. Other dangers of histamine blockers, such as Tagamet, Zantac, and Pepcid, are their interactions with other drugs. One example is that histamine blockers interfere with testosterone production, which results in breast enlargement and sexual dysfunction in men.[40]

The Importance of Stomach Acid

Prilosec, Prevacid, Nexium, and Protonix are among the proton pump inhibitors used as acid reflux medications. Proton pumps release hydrochloric acid—required for digestion--from the stomach lining. But proton pump inhibitors (PPIs) are so potent that they reduce stomach acid secretion by 90 to 95 percent for twenty-four hours. The more you take, the more you cause your body to have almost no stomach acid. No stomach acid means no digestion.

That is why the use of PPIs carries serious risks, especially nutritional deficiencies. Without hydrochloric acid, your body cannot digest and absorb most of the nutrients in your food. If you are eating nutrient-poor foods, the deficiencies are exacerbated.

These acid-reducing medications may help temporarily, but they are breaking down the digestive process. Inadequate amounts of hydrochloric acid mean the body has no first line of defense against pathogenic microorganisms. Yeast, bacteria, viruses, and parasites are little proteins, and when the pH in the stomach is correct, pepsin digests these microorganisms. These bugs become food. When the pH is out of whack, these organisms can thrive and increase dysbiosis in the gut.[41]

Using these drugs also destroys pepsin, the stomach's digestive enzyme. Without pepsin, proteins cannot break down into amino

acids, such as phenylalanine and tryptophan, which are vital to the production of serotonin and other vital neurotransmitters for the brain.

Serotonin is mostly produced in the intestines and only a small amount in the brain. Serotonin imbalances are implicated in major depression and suicide. Thus, is it hardly surprising that studies have shown people taking acid reflux medications also suffer from mood disorders and depression? Statins, the cholesterol-lowering medications, have similar correlations.[42]

The entire digestive system is heavily dependent on sufficient hydrochloric acid at the right pH levels. Because these drugs raise the pH in your stomach, the food will sit longer in the stomach and essentially rot. No doors will open or close at the right times (see Figure 2.8) and the numerous digestive enzymes won't break down or kill unwanted pathogens. Ironically, because of all this, acid reflux will persist because of the delay in gastric emptying.

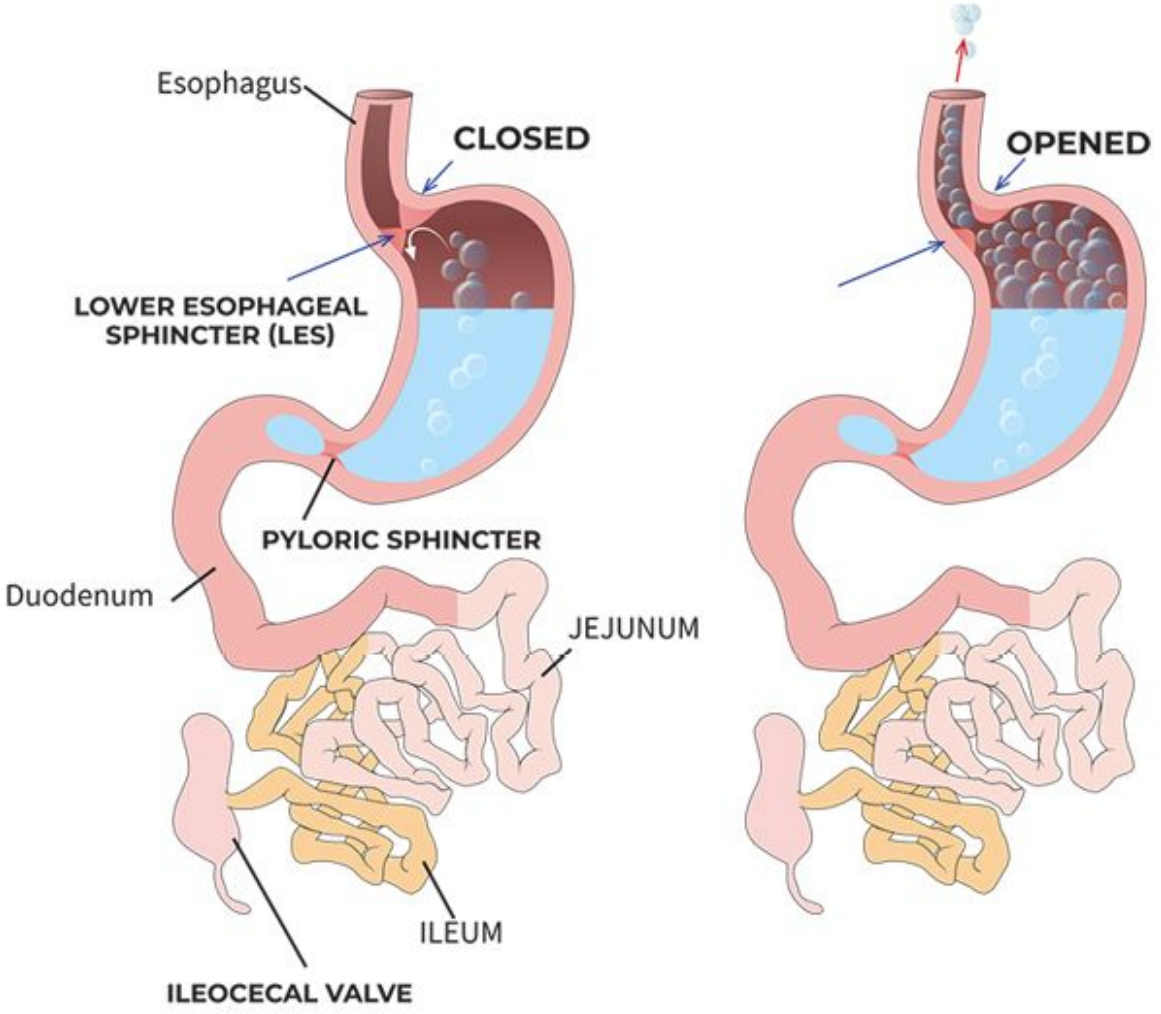


Figure 2.8. Improper Opening of LES Causing Acid Reflux.

Stomach acid prevents fungal and bacterial overgrowth. When carbohydrates ferment in the body, harmful bacteria can grow in fermenting foods and cause disease. The protective lining in the stomach also wears out. *H. pylori*, a stomach bacterium, can then proliferate and make holes in the stomach lining, causing ulcers and perhaps even ulcerative gastritis.

How to Safely Counter Acid Reflux

So how do we address acid reflux without acid reflux medication? Studies show that eating nutrient-dense foods and losing weight

alleviate heartburn and acid reflux disease. Also, eliminate trigger foods and toxic foods that cause distention and belching, and avoid drugs that raise the stomach's pH and reduce stomach acid. Eat at least two meals a day to ensure nutrient absorption without shocking the digestive process. Stress management and sleep are also critical.

For proper digestion to occur, the door between the esophagus and stomach (the lower esophageal sphincter), the door between the stomach and the small intestine (pyloric sphincter), and the door between the small and large intestine (ileocecal valve) need to open and close with ease. Don't tame heartburn and acid reflux with acid-reducing drugs. While you may feel instant relief, you're essentially saving one tree but burning the forest.

Gut Disease

This book is not organized by disease and protocols. For one, not all candida protocols work for everyone. That's why, instead of devoting a chapter to gut diseases, such as candida, irritable bowel, and leaky gut, I've mentioned them when they are relevant to the discussion.

Most gut disease can be alleviated with an animal-based diet. Gut disease often is not isolated. For example, candida is usually seen with heavy metals toxicity like mercury, even excess iron load, small intestinal bacterial (or fungal) overgrowth, parasites, and *H. pylori*. You will have to do a deeper dive and find out which specific meats are right for you.

Figure 2.9 depicts gut disease examples that can show up in specific areas of the stomach. While you can use this graphic as a general education tool, if you have chronic stomach pain, always work with your trusted practitioner.

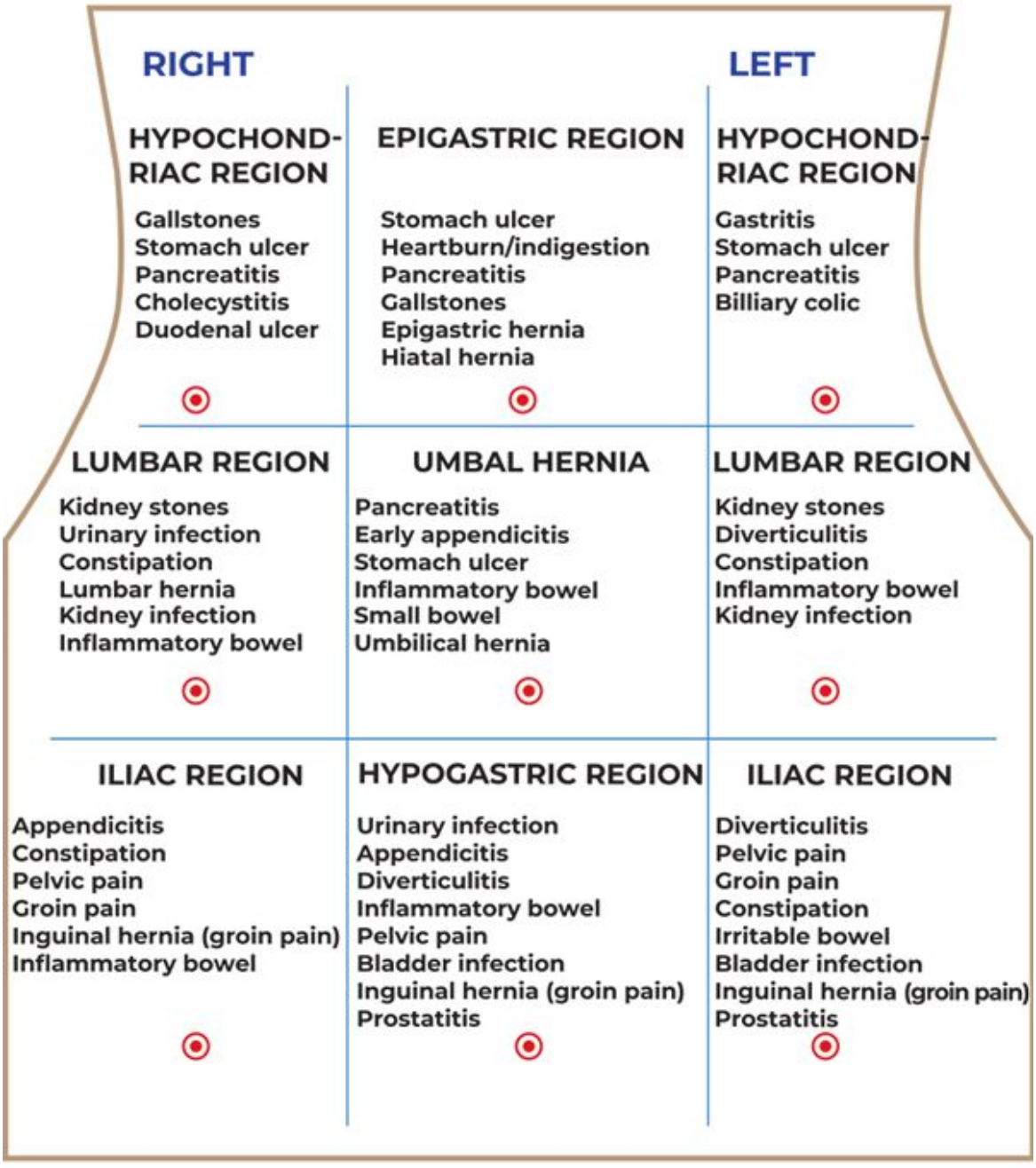


Figure 2.9. Gut Disease Based on Stomach Area.

Here are some topics to consider that may help you on your healing journey:

Irritable Bowel and Overgrowths in the Small Intestine

Look into glycosaminoglycans (GAGs). GAG chains contain units of modified sugars (glucosamine or galactosamine) and uronic acid. Yes, GAGs are the polysaccharides (carbohydrates) that are in meats. Most GAGs are in the connective tissue of meats. The GAG is the slightly transparent sliver between the steak and fat. If you suspect you have small intestinal bacterial overgrowth or irritable bowel, you may want to limit your consumption of connective tissue in meats. GAGs leech out of cartilage, ligaments, and joints and can sometimes feed bacterial overgrowth. Choose marrow bones and meat with little cartilage. Cook for shorter periods to make meat stock instead of bone broth.

A low FODMAP diet limits saccharide carbohydrates because these carbohydrates are harder to digest. These carbohydrates become fuel for the gut bacteria, and when there is an overgrowth of harmful bacteria, these saccharide-rich foods become a problem. High FODMAP foods also tend to draw liquid into the intestines, causing loose stools and bloat.

Maybe you get bloat, stomach pains, and even loose stools with bone broth or eating high-cartilage meats because of the polysaccharides and not because of the inability to eat fat. This is a perfect example of why it's better not to self-diagnose.

If you find that you cannot tolerate GAGs, you most likely cannot tolerate any foods that have glucosamine, galactosamine, hyaluronic acids, and sulfates. They are all a form or derivative of glycosaminoglycans.

Candida and Histamines

If you suspect candida or histamine intolerance, you may want to limit bone broth. But not every gut disease results from candida or

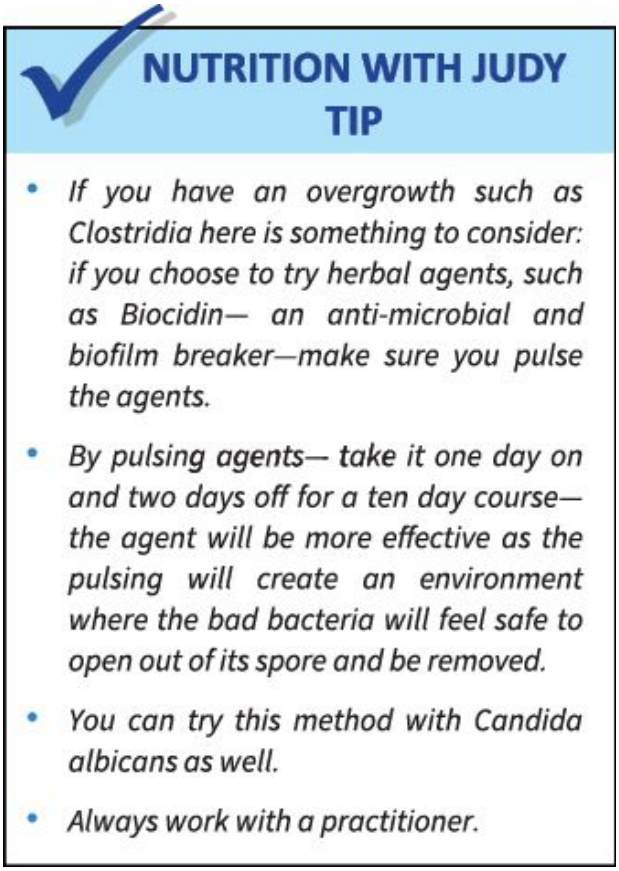
leaky gut. Candida seldom works alone, as it often is accompanied by parasites, fungus, and other microbiome damage.

C. albicans, which causes thrush, occurs naturally in the body. It can exist in the human organism without causing any harm. However, it can become a problem when it propagates excessively. Candida helps the body by consuming debris from toxins and food waste. If you have recurring candida overgrowth, search for contributing factors.

What if candida overgrowth is your body's way of telling you that there is something else going on?

Some examples:

- *Toxic heavy metals.* Candida thrives in heavy metal–polluted environments. And heavy metals can be found in food, air, water, body products, amalgam fillings, and vaccines.
- *Impaired digestion.* Candida thrives on simple sugars from foods. If you are not able to digest food properly (low stomach acid, insufficient digestive enzymes, and low or sludgy bile), then the undigested food will become a buffet meal for candida.
- *Bacterial overgrowth.* Candida eats the waste products of bacterial overgrowth. Also, bacterial overgrowth can destroy friendly bacteria in the intestines making candida overgrowth possible.
- *Nutritional deficiencies.* Candida exacerbates B vitamin deficiencies. I would also look into biotin (B7). The oxalate antinutrient impairs biotin-dependent enzymes, and candida overgrowth can result from a biotin deficiency.



According to Dr. Luc De Schepper, a physician specializing in homeopathy and acupuncture, biotin is formed in a healthy intestinal tract; when the tract is compromised by candida overgrowth, biotin deficiency is a common result. A study showed *C. albicans* cultured in a low biotin environment rapidly changed into its invasive mycelial form. Large doses of biotin have been found to stop candida from turning into its harmful state.

PLANT-BASED FOODS WITH HIGH HISTIDINES AND HISTAMINES

While histidines are more prevalent in animal foods, plant-based foods still contain histidines. Limit high histidine foods when struggling with histamines.

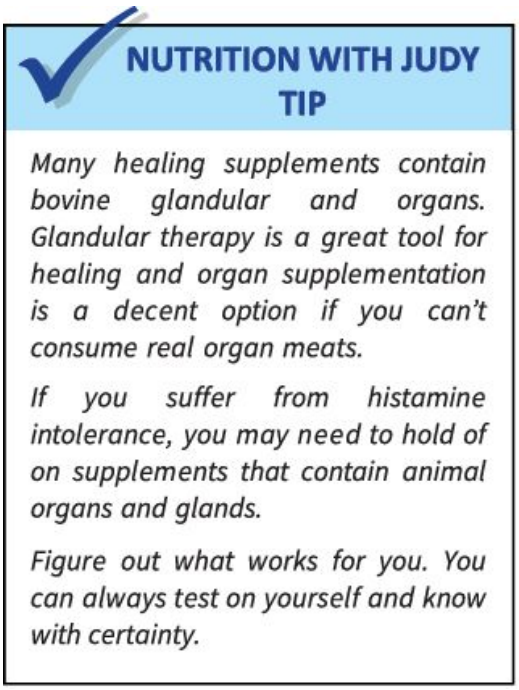
FOOD	AMOUNT PER 100 G	
• Garlic, raw	• 113 mg	
• Coconut meat	• 77 mg	
• Banana	• 77 mg	
• Raisin	• 72 mg	
• Kale	• 69 mg	
• Broccoli rabe	• 66 mg	
• Spinach	• 64 mg	
• Plantain	• 64 mg	
• Broccoli	• 59 mg	
• Asparagus	• 49 mg	
• Avocado	• 49 mg	
• Collards	• 47 mg	
• Shallot	• 43 mg	

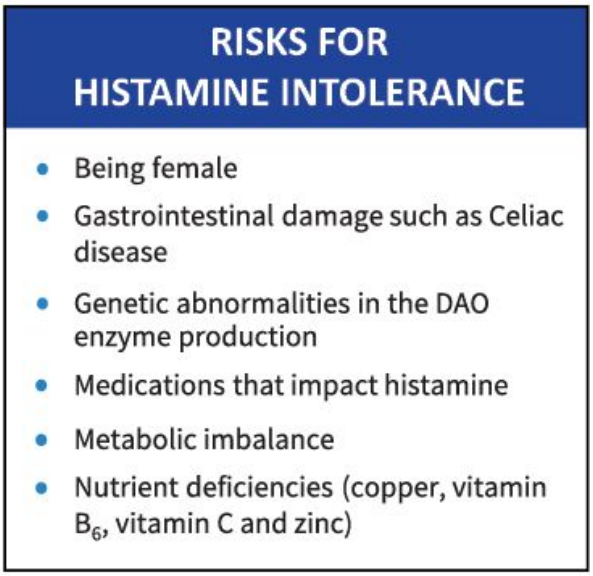
Table 2.10. USDA Nutritional Database.

When we are low in nutrients and cofactors, we are at a higher risk of overgrowths of fungus.[43]

But don't just go out and buy biotin. Work with your practitioner to formulate a safe detox protocol tailored to your needs. And only when your body is healthy enough to detox.

Histamine intolerance has been widely attributed to poor reactions to some types of meats (meats with connective tissue, aged meats, and canned meats) and bone broth. If you cannot tolerate glycosaminoglycans, the carbohydrates in meats, it may not reflect histamine intolerance but a need for more potent gut support.





Histamines are released from mast cells as the body needs to inflame for healing or an injury. Sometimes there are too many histamines in the body because of insufficient amounts of the enzyme, diamine oxidase (DAO). DAO breaks down histamines so that the body can then excrete any excess from the kidneys and urine.

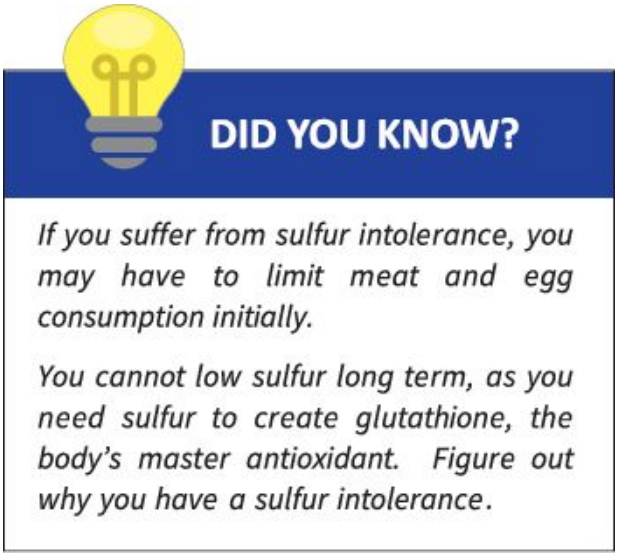
DAO is created in the kidneys, thymus, but mostly in the small intestine. Often people who suffer from histamine intolerance will heal their gut, especially the small intestine, and then tolerate more histamine-rich foods in their diet.

ANIMAL-BASED FOODS WITH HIGH HISTIDINES AND HISTAMINES

Histidine is an amino acid found in most animal proteins and with the help of enzymes, histidines can be converted into histamines. Histamines are released from mast cells as a response to tissue damage or an allergic reaction. Not all histidine converts to histamine but if you are suffering from histamines, you may want to limit high histidine foods while healing.

FOOD	AMOUNT PER 100 G	
Pork chop, raw	• 895 mg	
Gelatin, dry	• 662 mg	
Beef liver, raw	• 629 mg	
Salmon, raw	• 626 mg	
Turkey, baked	• 606 mg	
Ground beef, 85% lean / 15% fat, raw	• 606 mg	
Ribeye, raw	• 600 mg	
Chicken, baked	• 582 mg	
Lamb chops, raw	• 581 mg	
Chicken liver, raw	• 507 mg	
Bacon, raw	• 436 mg	
Shrimp, raw	• 413 mg	
Crab, Dungeness	• 354 mg	
Octopus, raw	• 286 mg	
Oyster, Pacific, raw	• 181 mg	
Beef suet, raw	• 48 mg	

Table 2.11. USDA Nutritional Database.



Don't focus on just eating DAO-rich meats, which is a quick fix, not a permanent one. Find out why you have high histamines or low levels of DAO. If you suffer from histamines, you don't have to remove ground beef, aged meats, bone broth, jerkies, and other histamine-rich meats from your diet forever. Heal your gut. Then try to slowly reintroduce these foods. You should be able to tolerate more foods.

The important message here is that unless every single component of the digestive system works properly, it will eventually break down. Once it breaks down, it is only a matter of time before we get sick. Really sick.

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Chapter 3

Don’t Eat This

If you don’t recognize an ingredient, your body won’t either.

— Unknown

YOU’VE LEARNED THAT eating foods to support gut health is critical. What foods are beneficial, and what foods are harmful to gut health? I’ll start with what not to eat.

This chapter makes the case that, except perhaps boiled grass-fed, grass-finished meats, nearly all foods are less than ideal. The goal is to remove most toxins from the body while balancing real life; that is, limit as many of the carcinogenic and banned foods as possible while allowing yourself to eat these foods from time to time. What you want to achieve is progress, not perfection. You can remove toxins from your food, but you will still get exposure from the air, water, and dirt.

The point here is to make you aware of which foods are problematic and why and help you make better choices when options are available. If you heal the gut and remove most of the inflammatory foods from the body, the body should be able to keep you safe from some toxins. You don’t need to make the environment wholly sterile for your body to thrive. Give the body a bit more credit.

If you gain anything at all from this book, it will be to treat your gut kindly and try to remove specific toxins from your diet. So, let’s talk through some of these ingredients.

The Delaney clause in a 1958 amendment to the Food, Drugs and Cosmetics Act of 1938 stipulates that “if a substance is found to cause cancer in humans or animals, it cannot be used as a food additive.” While the U.S. Food and Drug Administration has tried to uphold this requirement, it hasn’t always succeeded.

Some additives and ingredients found in foods are not necessarily safe. I could write a whole book on only toxic ingredients, additives, and chemicals to avoid. Many books and free publications, as well as information on the Environmental Working Group’s website and the information in PubChem, the National Institutes of Health’s database of chemicals and how they affect biology, provide more information about any specific additive or chemical.

Food Additives Banned by the FDA

Table 3.2 depicts synthetic food substances and additives that clinical studies have shown to cause cancer in lab animals. The FDA banned them in late 2018 but gave food companies until October 2020 to remove them from their products. But because a deadline can always be extended, I recommend removing from your diet foods that contain these ingredients. And if the slow-moving, ambivalent FDA says no, it’s a definite no.[44]

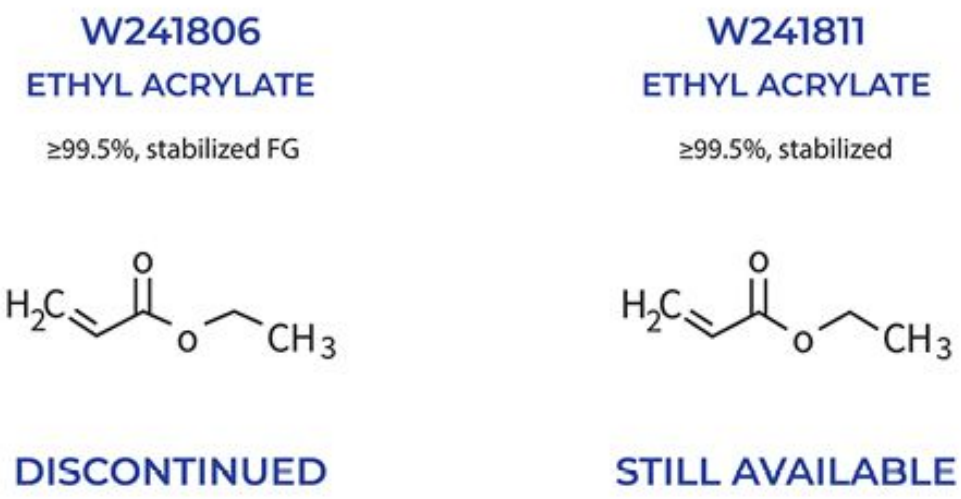


Figure 3.1. Sigma Aldrich, "Ethyl Acrylate Products," 2020. https://ww.sigmaaldrich.com/catalog/product/aldrich/w241806?lang=en&region=US https://www.sigmaa ld rich .com/catalog/product/a ld rich/w241811 ?la ng=en&region=US

One company is being compliant with the FDA ban and has discontinued the production of Ethyl Acrylate. They now offer a very similar replacement product (Figure 3.1). Now I'm not a chemist, but the chemical makeup looks similar.[45]

Table 3.2 shows a sample list of food additives that have been banned over the years. You can see some of the health risks in the table.

U.S. FOOD ADDITIVIES BANNED IN 2018
1 of 2

ADDITIVE	WHAT IS IT
Benzophenone	• A potential aspiration hazard, and "ingestion of significant amounts may cause respiratory depression. Vomiting may cause aspiration into the lungs, which may result in chemical pneumonitis." Skin contact can cause irritations to the eyes, skin, and respiratory tract. Benzophenone has been shown to have adverse effects on reproductive and hormonal functions in fish. • Added to food as an organic flavoring agent. It occurs naturally in wine grapes, especially muscat grapes, and also in black teas. The Environmental Working Group estimates that consumption of 200 grams of grapes would result in exposure to nearly 20 micrograms of benzophenone. • Benzophenone has also been found in tap water worldwide. Worldwide testing has shown benzophenone in packaging for milk cartons (China), baked goods and pasta (Spain), frozen foods (U.K.), and soft drinks (Spain). Breakfast cereals, cakes, and baked goods have the highest concentrations of benzophenone.
Ethyl Acrylate	• Ethyl acrylate is a colorless liquid that carries a chemical safety warning as a flammable and irritant; it can affect the nervous system by causing dizziness and nausea. It can also cause skin allergies, manifested as itching and a rash. Ethyl acrylate is a volatile reactive chemical (it can explode). It is used as a flavoring agent in foods, including pineapple and passion fruit. • According to a recent report prepared for the U.S. Department of Health and Human Services, ethyl acrylate is used in almost everything: latex products, resins, food packaging, and furniture. It is used as a sealant for envelopes and medical items. It is in many personal care products as a fragrance additive. Yes, your soaps, lotion, detergent and creams can have the ethyl acrylate, a known flammable and irritant that causes skin allergies.
Methyleugenol	• A likely carcinogen per rodent studies. It occurs naturally in plants and essential oils, including herbs and spices such as lemongrass, mace, tarragon, bay leaf, tarragon, allspice, and cloves. Also found in bananas and grapefruit. • Also present as a flavoring agent, it is used in nonalcoholic beverages, chewing gum, pudding, relishes, candy, baked goods, jellies, ice creams, and ices. It is also used as a fragrance in perfumes, skin creams and lotions, soaps, and detergents. • Many citronella oils, often used as a natural mosquito repellant, contain methyleuganol as an active ingredient. While many people consider citronella a safer insect repellant than bug sprays that contain DEET, studies show that methyleugenol can be carcinogenic and may bind to DNA. Methyleugenol's DNA fingerprint has been found in human liver tissues. Skip the citronella insect repellants. These candles, lotions, bracelets, and stickers often are ineffective, anyway. Stick to clothes that cover the body and use fewer products.

Table 3.2. Part 1. Kim et al., "Effects of benzophenone-3 Exposure on Endocrine Disruption."; International Agency for Research on Cancer, "Benzophenone."; International Agency for Research on Cancer, "Methyleugenol."

U.S. FOOD ADDITIVIES BANNED IN 2018
2 of 2

ADDITIVE	WHAT IS IT
Myrcene	• Myrcene is one of the seven synthetic flavoring food additives banned as of 2018 but allowed to remain in food until October 9, 2020. Myrcene is a primary component of plants' essential oils, including cannabis, lemongrass, verbena, hops, and even mangoes. It has an earthy, minty, and citrus-like scent. In March 2015 an osteoarthritis study published in the European Journal of Pharmacology demonstrated that myrcene has beneficial anti-inflammatory properties and the ability to prevent the breakdown of muscle mass. • Synthetic myrcene has been found to induce kidney and liver tumors in rodents. It's true that natural and synthetic substances are often not the same, but I'd still be wary. Myrcene is a significant component of essential oils and other plant seasonings and has been banned by the FDA.
Pulegone	• Pulegone is a naturally occurring organic compound from the essential oils of such plants as catnip, peppermint, and pennyroyal. Pulegone is a colorless oily liquid and its smell is similar to peppermint and camphor. • Pulegone is a blend of oil extracts from mint plants, including peppermint and spearmint. It has also been found to be a carcinogen that causes liver cancer, a precancerous lung condition, and other disease when given orally to rodents. • Remember, in 2018, the U.S. Food and Drug Administration banned synthetic pulegone as a food additive. Studies by the Centers for Disease Control and Prevention detected substantial amounts of pulegone in menthol-flavored electronic cigarette liquids and smokeless tobacco products in the United States.
Pyridine	• Pyridine is a highly flammable chemical compound with an unpleasant fish-like smell. Pyridine is used as a solvent and shows up in many different products, including food (as a flavoring), medicines, vitamins, adhesives, dyes, paints, pesticides, rubber products, and waterproof fabrics. • Many foods have distinctive flavors because of the complex compounds that contain pyridine. Food and cigarette smoke are the most significant sources of exposure, according to Public Health England.

Table 3.2. Part 2. Center for Food Safety and Applied Nutrition, "FDA Removes 7 Synthetic Flavoring Substances," FDA list.; Rufino et al., "Evaluation of the Eects of E Limonene."; USFDA, "Food Additive Regulations."; Jabba and Jordt, "Risk Analysis for the Carcinogen Pulegone."; Public Health England, "Pyridine —General Information," January 2019.pdf.

BANNED FOOD ADDITIVES (1941 – 1998)

Food additives aren't always safe. The following additives were supposedly tested and safe, until they were found to pose health risks (likely carcinogens). These food additives are now banned in all foods.

ADDITIVE	USAGE	YEAR BANNED	HEALTH RISK
Agene (Nitrogen Trichloride)	Flour bleaching and aging agent	1949	• Dogs ate flour and suffered epileptic-like fits
Cinnamyl Anthranilate	Artificial flavoring	1982	• Liver cancer
Cobalt Salts	Stabilize beer foam	1966	• Toxic effects on heart
Coumarin	Flavoring	1970	• Liver poison
Cyclamate	Artificial sweetener	1969	• Bladder cancer and damage to testes. Not thought to directly cause cancer, but may increase potency of carcinogens.
Diethyl Pyrocarbonate (DEPC)	Preservative	1972	• Combines with ammonia to form urethane, a carcinogen
Dulcin (P-Ethoxy-Phenylurea)	Artificial sweetener	1950	• Liver cancer
Ethylene Glycol	Solvent	1998	• Kidney damage
Monochloroacetic Acid	Preservative	1941	• Highly toxic
Nordihydroguaiaretic Acid (NDGA)	Antioxidant	1968 (FDA), 1971 (USDA)	• Kidney damage
Oil of Calamus	Flavoring	1968	• Intestinal cancer
Polyoxethylene-8-Stearate (MYRJ 45)	Emulsifier	1952	• High levels caused bladder stones and tumors
Safrole	Flavoring (root beer)	1960	• Liver cancer
Thiourea	Preservative	1950	• Liver cancer

Table 3.3. Center for Science in the Public Interest, "Banned Additives," CSPI, Accessed (2020).

Additives Banned in Other Countries

There are many many food additives and ingredients that are permitted in the United States but banned in other countries. Table 3.4 reviews some of these additives. If these harmful toxins can get swapped out and still make similar products in other countries, why are they used in the United States?

FOOD ADDITIVES USED IN THE UNITED STATES BUT BANNED IN MANY COUNTRIES, (1 of 3)

These food additives are permitted in the United States but banned in many countries due to health risks. Why?

NAME	WHAT IS IT	FOUND IN	HEALTH RISK
Neonicotinoid Pesticides	• Neuroactive insecticides, chemically similar to nicotine • Sprayed on crops and sticks to pollen and nectar	• Foods and plants from affected soils • Over 140 crops. Cherries and strawberries contain multiple neonicotinoids	• Carcinogenic to humans. Insects and birds die when consuming neonicotinoid-touched plants • This is the leading driver of the declining of bees
Neonicotinoid Banned Countries: Most European Union countries have banned this pesticide.			
Brominated Vegetable Oil (BVO)	• BVO is used to keep citrus flavoring from separating in sodas and other drinks • Pepsi removed BVO from all Gatorade drinks in 2013 • In 2014, Coca Cola made a similar move	• BVO is a patented flame retardant and used in plastics • Mountain Dew, Squirt, Fanta Organ and Fresca Citrus contain BVO • About 10% of all sodas in the U.S. contain BVO	• Large amounts of soda consumption containing BVO can cause memory loss, skin lesions, and nerve disorders • BVO competes with iodine receptors which can lead to autoimmune disease, hypothyroidism, and cancer. Bromine, the main compound, is a toxic chemical that can cause organ system damage, hearing loss, mental disorders, and, birth and growth defects
BVO Banned Countries: BVO is banned in Japan and many European countries.			
Potassium Bromate	• Potassium bromate is an oxidizing agent and whitening agent • It is added to flour to appear whiter and for flour to rise higher	• Flour and packaged breads and bakery foods	• In 1990, a study showed that Potassium Bromate (KBRO3) induced renal cell tumors, mesothelioma and follicular cell tumors of the thyroid • Potassium bromate also has the potential to disrupt the genetic material within cells • In California, foods that contain potassium bromate must carry a warning label
Potassium Bromate Banned Countries: It is banned in the U.K., Canada, Brazil, and the E.U.			

Table 3.4. Part 1. Rabin Roni. "Why Foods are Banned in Europe but not U.S." *New York Times*, (2018).

FOOD ADDITIVES USED IN THE UNITED STATES BUT BANNED IN MANY COUNTRIES, (2 of 3)

NAME	WHAT IS IT	FOUND IN	HEALTH RISK
Butylated hydroxyanisole (BHA) and Butylated hydroxytol-uene (BHT)	• Butylated hydroxyanisole (BHA) and Butylated hydroxytoluene (BHT) are made from petroleum and used as preservatives and flavor enhancers to prevent oils in foods from oxidizing and becoming rancid • BHA/BHT is allowed to contain up to 0.5% phenolic impurities and up to 2 mg/kg of lead	• Beer, butter, cereal, dehydrated potatoes, gum, meat and mixed nuts • Both BHA and BHT are used in lipsticks, moisturizers, other cosmetics, medications, oral suspension medications and resin-based dental sealants • Both BHA and BHT are considered antioxidants	• The Center for Science in Public Interest recommends to "avoid" BHA and "cautions" against BHT • BHA/BHT can cause allergic reactions in the skin. The International Agency for Research on Cancer classifies BHA as a "possible human carcinogen." The European Commission on Endocrine Disruption has also listed BHA as a Category 1 priority substance, based on evidence that it interferes with hormone function, such as mimicking estrogen and prevent the expression of male sex hormones
BHA/BHT Banned Countries: Banned in the United Kingdom, Japan, and many European countries.			
Azodicarbon-amide	• Industrial chemical • Most countries wait a week for flour to whiten. Not in the United States. The USDA approved azodicarbonamide as an additive for foods • Added as an instant bleaching agent for flour. Used as a whitening agent in flour and as a dough conditioner in baking bread	• It was used in Subway sandwich breads for a long time. They finally decided to remove it in 2014 • Boxed pasta mixes, breads, flour frozen dinners and packaged baked goods • It is also used in foamed plastics such as yoga mats and soles of sneakers	• Increases irritability of gluten • Creates toxic byproducts when heated, causing free radical damage to DNA • Asthma and other respiratory disease • Skin irritant • Disrupts the immune system • Harmful to hormone function
Azodicarbonamide Banned Countries: Australia, Singapore and most European cities. It is *so* banned in Singapore that if a company is caught using Azodicarbonamide, they can get fined up to 15 years in prison and slapped a $500,000 fine. Yet Americans ate this toxin everyday in their Subway sandwiches.			

Table 3.4. Part 2. Rabin Roni "Why Foods are Banned in Europe but not U.S." *New York Times*, (2018).

FOOD ADDITIVES USED IN THE UNITED STATES BUT BANNED IN MANY COUNTRIES, (3 of 3)

NAME	WHAT IS IT	FOUND IN	HEALTH RISK
Diphenylamine (DPA)	• The glossy sheen which protects food from browning during long term storage. Mainly used in fruits such as apples and pears	• Apples, apple products, pears, and baby food • Naturally found in coriander	• Possible break down into nitrosamines (carcinogen). • May cause severe irritation to eyes and considered a health and environmental hazard, as well as an acute toxin.
DPA Banned Countries: The active substance diphenylamine is not approved in the E.U.			
recombinant Bovine Growth Hormone / Somatropin (rBGH) / (rBST) and Ractopamine	• Synthetic hormones injected into cows that allow for 10% increase in milk production. It is also injected into animals to fatten cattle, pigs and turkeys before slaughter • Ractopamine is a feed additive that promotes leanness in animals	• Dairy products such as cheese, milk, yogurt, and ice cream	• These milks have significant amounts of IGF-1 (insulin growth factor) which has been linked to various cancers
rBGH Banned Countries: Japan, most countries in Europe and in Japan. U.K. bans rBGH or rBST in infant formula. If it's not safe for our children, it should not be safe for anyone.			
Arsenic	• Arsenic is a toxic element found in nature • There is organic arsenic found in animal and plant tissues • There is inorganic arsenic found in soils, rocks and water • The inorganic is the more toxic form	• Poultry. Arsenic is permitted in poultry feed to stimulate growth and boost pigmentation in poultry flesh • Found in drinking water and seafood • High levels of inorganic arsenic is found in all rice (USDA allows limited arsenic in rice) • Brown rice syrup found to be highest in arsenic and used in baby formulas and gluten-free foods	• Long term exposure to arsenic can cause most forms of cancer • Prolonged exposure can increase risk of heart disease, diabetes and neurotoxicity • Pregnant women with arsenic poisoning can lead to birth defects or fetal complications after delivery • Development risks with children are regularly exposed to arsenic
Arsenic Banned Countries: Japan and most E.U. countries ban arsenic in livestock feed. Organic and inorganic arsenic in crops is nearly impossible to ban and regulate.			

Table 3.4. Part 3. Rabin Roni. "Why Foods are Banned in Europe but not U.S." *New York Times*, (2018).

Artificial Food Dyes

Nearly half of all foods marketed to children use food coloring.[46] A Purdue University study published in the journal *Clinical Pediatrics* found that 96.3 percent of tested candy, 94 percent of tested fruit-flavored snacks, 89.7 percent of tested drink mixes and powers, and 86 percent of tested frozen breakfast foods contained artificial food dye.[47]

Since July 2010, most European foods containing artificial dyes must carry labels warning that the food may cause hyperactivity in children. The Center for Science in the Public Interest reports that dyes may cause organ damage, cancer, congenital disabilities, allergic reactions, hyperactivity, or behavioral problems in children. Red 40, Yellow 5, and Yellow 6 are contaminated with carcinogens. This may be why in the United Kingdom, Fanta orange soda is colored with pumpkin and carrot extracts, while in the United States, Fanta uses Red 40 and Yellow 6. McDonald's strawberry sundaes are colored only with strawberries in the United Kingdom, but Red 40 in the United States. See Figure 3.5 for the full ingredient list.[48]

Figure 3.5. McDonald's Sundaes: Why the Difference?

Artificial colorings in foods and beverages are toxic to children. In 2014, one study assessed, by category and company, the percentage of grocery store products marketed to children that contain artificial food dyes. The research team collected product and food-color information for about 810 products in one grocery store in North Carolina. Of those, 350 products (43.2 percent) contained artificial food coloring. The most common artificial food colorings were Red 40 (29.8 percent of products), Blue 1 (24.2 percent), Yellow 5 (20.5 percent), and Yellow 6 (19.5 percent). Produce was the only category that did not have any artificial colorants. The highest percentage of products with artificial food coloring was candy (96.3 percent), fruit-flavored snacks (94 percent), and drink mixes/powders (89.7 percent). Forty-one of the sixty-six companies whose products the research team gathered marketed products containing artificial food coloring.[49]

FOOD DYE IN MODERATION

Clinical studies show that some children are affected by artificial dyes at doses up to 35 mg and most children are affected at 100 mg.

PRODUCT	FOOD DYES	AMOUNT
Target Mini Green Cupcakes	• Blue 1 • Red 40 • Yellow 5 • Yellow 6	• 55.3 mg per serving
Kool-Aid Burst Cherry	• Blue 1 • Red 40	• 52.3 mg per 8 ounces
Sunny D Orange Strawberry	• Red 40 • Yellow 6	• 41.5 mg per 8 ounces
Cap'n Crunch's Oops! All Berries	• Blue 1 • Red 40 • Yellow 6	• 41 mg per serving
General Mills' Trix	• Blue 1 • Red 40 • Yellow 6	• 36.4 mg per serving
Crush Orange	• Red 40 • Yellow 6	• 33.6 mg per 8 ounces
Skittles	• Blue 1 • Blue 2 • Red 40 • Yellow 5 • Yellow 6	• 33.3 mg per serving
Fruity Cheerios	• Blue 1 • Red 40 • Yellow 6	• 31 mg per serving
M&M's	• Blue 1 • Blue 2 • Red 40 • Yellow 5 • Yellow 6	• 29.5 mg per serving
Powerade Orange Sports Drink	• Yellow 5 • Yellow 6	• 22.1 mg per 8 ounces
Kraft Macaroni & Cheese	• Yellow 5 • Yellow 6	• 17.6 mg per serving
Keebler Cheese & Peanut Butter Crackers	• Yellow 6	• 14.4 mg per serving

Table 3.6. Stevens, Laura et al., "Amount of Artificial Dyes and Added Sugars in Foods," *Clinical Pediatrics*, (2014), 309-321.

Have you ever wondered what the numbers in the names of food dye colors mean? They are codes—the chemical structures of Blue

1 and Blue 2 are different. The numbers are not sequential because, over the years, the FDA has banned many artificial food colorings found to be carcinogenic.[50] Seventeen of twenty-four colored dyes were banned or voluntarily withdrawn from the market. That's a 70 percent failure rate.

Coloring is used solely to make food look more appealing. This means more food coloring makes food more aesthetically pleasing to the eyes and motivates more purchases and money for the food industries.

FOOD DYES IN THE UNITED STATES

Since the 1985 efforts to ban food dyes, artificial food dye use increased by 300%.

DYE	MAIN USES	POUNDS CERTIFIED (1984)	POUNDS CERTIFIED (2005)	TOXICITY FINDINGS	NOTE
Blue 1	• Baked goods • Beverages • Candy	• 260,417	• 1,802,634	• Chromosomal damage	• Banned in Finland and France
Blue 2	• Beverages • Candy • Pet foods	• 101,223	• 642,246	• Brain tumors	• Banned in Norway
Green 3	• Beverages • Candy	• 3,597	• 13,747	• Bladder tumors	• Banned in European Union
Red 3	• Baked goods • Candy • Desserts	• 241,265	• 260,851	• Chromosomal damage • Thyroid tumors	• FDA tried to ban but failed
Red 40	• Beverages • Candy • Desserts • Pet food	• 2,630,578	• 6,541,368	• Lymphomas (lymph tumors)	• Banned in European Union
Yellow 5	• Baked goods • Beverages • Pet food	• 1,620,540	• 4,231,420	• Allergies • Chromosomal damage • Lymphocytic lymphomas • Thyroid tumors	• Banned in Norway
Yellow 6	• Beverages • Candy • Desserts • Sausage	• 1,530,050	• 4,156,408	• Allergies • Chromosomal damage • Kidney tumors	• Banned in Norway, Sweden
	TOTAL	6,392,670	17,648,674		

Table 3.7. FDA, "Summary of Color Additives for Use in the United States," FDA, (2015).

Worse yet, the Food and Drug Administration has acknowledged that Red 3 is a carcinogen. Back in 1984, the acting commissioner of the FDA, Mark Novitch, said that Red 3 “has clearly been shown to induce cancer” in animal studies and was “of greatest public health concern.” On April 2, 1985, the FDA extended the deadline for a decision on food dye safety for the twenty-seventh time. The FDA said it needed more time to make a decision.[51]

In 1990, the FDA finally banned some uses of Red 3, including anything applied to the skin, stating that high doses of the color

additive can cause cancer in lab animals. But it remained legal to continue to put Red 3 in foods. If you consume Red 3, you have a greater chance of suffering thyroid cancer and chromosomal damage—which even the FDA acknowledged.[52]

Table 3.8. Food Dyes Banned.

Red 3 remains a legal food additive today. Red 3 is dangerous for our skin but safe to digest?

Annually, food companies use about 200,000 pounds of Red 3 to make such items as Fruit Roll-Ups and Kid Cuisine frozen meals.[53]

The FDA's definition of safety for color additives states, as published in the 2019 *Code of Federal Regulations*, that "safe means that there is convincing evidence that establishes with reasonable certainty that no harm will result from the intended use of the color additive."

More frightening is that Americans are now consuming five times more artificial food colorings than in 1955.

In 2005, it was considered reasonable for an American twelve-year-old to consume more than ten pounds of food dye. The certified

amount rose from 12 mg per capita per day (0.0002 teaspoons) in 1950 to 62 mg (0.002 tsp) per capita per day in 2010.[54] What changed? The 2014 study that found this increase is alarming because the amounts of coloring found in a single serving are higher than levels demonstrated in clinical trials to impair children's behavior. Researchers estimate that children could easily consume 100 to 200 mg of artificial food coloring daily.

Figure 3.9. Ingredients in Chocolate M&Ms.

According to the Center for Science in the Public Interest, "FDA tests show that the three most-widely used dyes, Red 40, Yellow 5, and Yellow 6, are tainted with low levels of cancer-causing compounds, including benzidine and 4-aminobiphenyl in Yellow 5. However, the levels actually could be far higher..."[55]

In 2011, the FDA acknowledged that food dyes cause behavioral problems in some children, but has done nothing to protect children.

To add the Red 3 maraschino cherry on top, some food companies illegally add food dyes that are banned in the United States. In 2015,

researchers reported in the *Journal of Food and Drug Analysis* that they had tested twenty chili powders and syrup-preserved fruits. Amaranth was found in some of the samples, a red dye that is illegal in most countries, including in the United States.[56]

Many dietitians and food chemists argue that the amount of food dye consumed is critical. Everything in moderation, right? If the food we consume and our air and water are contaminated, how do you assign relative harm to each item? Of course, consuming a single food containing artificial coloring will not cause artificial food color toxicity. Still, given the ubiquity of these dyes in packaged foods, over time, we may reach the aggregate danger levels found in clinical trials. I'd rather not risk consuming any of these in any amount because some will naturally make their way to us in water, personal care products, and food when traveling, dining out, and living real life.

Before turning to natural color alternatives, we need more research on the toxic potential of natural colorants before sanctioning their use, especially for children. For example, annatto is used to color cheddar cheese. As a potential allergen, annatto has been linked to many cases of food-related allergies. It is the only natural food coloring believed to cause as many allergic reactions as artificial food colorings. Yes, even natural colorings can cause allergic symptoms.

Bottom line? Avoid foods with any colorings and dyes, which is nearly impossible because they are in almost everything. But if an artificial colorant is listed on the label, including labels on personal care products, ditch the product.

Other Food Toxins

Other additives and foods can be harmful to optimal health and may result in food sensitivities.

Produce and Pesticides

The Environmental Working Group's Dirty Dozen and Clean Fifteen lists enumerate nonorganic produce with the most and least amount of pesticides. The Dirty Dozen list changes annually (Table 3.10), depending on the superbugs and spray used on the fruits and vegetables. The solution is to buy organic produce, right? Unfortunately, this, too, can be problematic. I'll discuss organic plant-based foods in Chapter 6.

EWG'S DIRTY DOZEN LIST (2020)
• Strawberries (over 13 pesticides)
• Spinach
• Kale
• Nectarines
• Apples
• Grapes
• Peaches
• Cherries
• Pears
• Tomatoes
• Celery
• Potatoes
• Hot peppers

Table 3.10. EWG's Dirty Dozen List.

Sprouts are not on the Dirty Dozen list, but they are a breeding ground for bacteria. Sprouts must be raised in warm, humid

conditions, which is where harmful bacteria such as *E. coli* and salmonella also thrive. Many outbreaks of food-borne illness owe to sprout contamination.[57]

Canned Foods

Cans have resin in their lining and lids, and the resin contains compounds such as bisphenol A (BPA) and phthalates; these compounds leach into the foods and make their way into our bodies. BPA and other resins cause disruptions in the estrogen hormone. Estrogen imbalances can lead to estrogen dominance, weight gain, and irregular periods. In men, estrogen can cause infertility and erectile dysfunction. Elevated levels of estrogen are risk factors for breast, ovarian, and endometrial cancer.

Although companies have removed most of the BPAs in plastics and baby formula packages, BPA still lines about 75 percent of canned foods. BPA protects the metal from corrosion, which gives bacteria no way to enter the can.[58] Glass jars are better options.

A study from Harvard found that college students who drank most of their cold drinks from polycarbonate bottles for just one week had 69 percent more BPA in their bodies than those who spent a week drinking cold drinks from other containers.[59]

Cash register receipts and boarding passes also have a significant amount of BPA. BPA can be absorbed through the skin, ingested, or inhaled. A study with pregnant women found that cashiers had the highest BPA levels, 25 percent higher than BPA levels of women consuming one or more canned vegetables per day.[60]

Studies also show a link between depression and ADHD behavior in children who consume BPAs from canned foods.[61] Many companies are moving away from BPA to its cousins, such as bisphenol-S

(BPS) and bisphenol-F (BPF), which are no better. One study showed that BPS blocks estrogen receptors in female rats, and both BPA and BPS cause heart arrhythmias in rats. Other cousins are BPAB, BPAF, BPB, and BPZ. A preliminary study has shown that these alternatives are even more harmful than BPA.[62]

The best bet is to minimize plastic. My kids now use stainless steel and bamboo cups, but removing plastic is still a work in progress.

Lavender and Tea Tree Essential Oils

Studies show that all lavender essential oils are endocrine disrupters. Lavender acts like estrogen. A *New England Journal of Medicine* study found that when testing 100 percent pure lavender essential oil on estrogen receptors, they were activated by even the highest quality lavender. As research scientist Anthony Jay discusses in detail in *Estrogeneration*, similar results were found with tea tree oil.[63]

Skip lavender and tea tree oils. None of the benefits outweigh the effects on our estrogen receptors.

NATURALLY OCCURRING PHYTOESTROGENS
These plant-based foods have naturally occurring phytoestrogens that can mimic the estrogen produced in the human body.
• Berries
• Dried fruits
• Edamame
• Flax seeds
• Garlic
• Peaches
• Sesame seeds
• Soybeans
• Tempeh
• Tofu
• Wheat bran
• Seed oils

Table 3.11. Naturally Occurring Phytoestrogens.

Estrogenic Foods

Some foods are known to have phytoestrogens — foods that mimic estrogen. Some people need estrogen support, especially during menopause, but a high intake of phytoestrogens has been shown to cause hormonal imbalance. You can see some estrogenic foods in Table 3.11. In Chapter 10, you can see a list of phytoestrogens in both animal and plant-based foods.

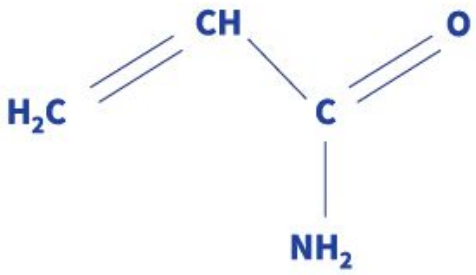
Fried Foods and Acrylamides

When any protein is fried in oil, acrylamides are formed. Acrylamides are carcinogenic.[64] Foods with acrylamide are typically cooked commercially, but they also occur in home-cooked meals when the cooking temperature is greater than 248 degrees Fahrenheit. Foods containing acrylamides include breakfast foods, fries, chips, and

pastries. Baked and fried starchy foods contain large amounts of acrylamides, and animal products or raw plant foods have less.

ACRYLAMIDE EXPOSURE BY FOOD TYPE

FOOD TYPE	PERCENT
French fries	• 16 - 30%
Potato chips	• 6 - 46%
Coffee	• 13 - 39%
Pastries and sweet biscuits	• 10 - 20%
Bread and toast	• 10 - 30%
Other food items	• < 10%



ACRYLAMIDE

Table 3.12. National Institute of Environmental Sciences, "Acrylamide," NIH, (2015).

Nitrates and Nitrosamines

Processed meats such as deli meats and sausages may contain nitrates or nitrites. Both help the meat to stay fresh and make meat look appetizing. When you heat meats with nitrates or nitrites, they turn into nitrosamines, a carcinogenic compound.[65]

Aluminum Foil

Most people use foil in the kitchen, especially in the oven and on the grill. Oil can release aluminum oxide from the aluminum, causing this toxin to seep into foods. Instead of using aluminum foil, you can use a baking sheet, metal lid, or parchment paper. Enamelware and Dutch ovens with lids are good baking and storage options.

I discuss the dangers of aluminum in more detail in Chapter 18.

Dairy

Many people feel better if they eliminate dairy. Some consider dairy sensitivities to include bloating, gas, skin eruptions, nausea, and other physical symptoms. If you think of milk's purpose, it is for the growth of offspring. Calves drink mother's milk for about eight to ten weeks. Calves typically drink 10 percent of their birth bodyweight. Thus, a calf born at 90 pounds (41 kg) would drink 9 pints, or 4.5 quarts, a day.[66]

The average weight of a three-month-old calf ranges from 220 pounds (100 kg) to 265 pounds (120 kg). That is almost three times their weight at birth.

An average human baby is about 7.5 pounds (3.4 kg) at birth. After about three months, the average baby weighs about 13 pounds (6 kg). This does not consider whether the baby was bottle- or breast-fed. Still, a human baby barely doubles in weight in the three months that a calf triples in mass.

Do you wonder why we gain weight from eating dairy? Dairy is meant to grow a calf, not to be consumed as a large part of our meals. Worse, we consume dairy primarily in the form of cheese. But cheese has even higher concentrations of milk than plain milk. We are also the only species that drinks another species' milk.

Because of a group of peptides called beta-casomorphins, which are casein-derived morphine-like compounds, cheese can also have an addictive quality. Casomorphins attach to the same brain receptors that recreational drugs attach to. Opiates have a calming effect and release dopamine in the brain. Cheese has a similar effect. Seventy to 80 percent of the protein in milk is casein. A cup of milk has 7.7 grams of protein, but making the milk into cheddar cheese significantly increases the protein content, making cheese the most

concentrated form of casein. Additionally, studies have found that the opioid peptide casomorphine also releases histamines in humans.[67]

Overall, dairy can have a place in a carnivore diet but keep it as a nibble, not as the main course. You're not trying to triple your weight in three months.

Pasteurized Milk

Pasteurized milk is not the same as raw (unadulterated) milk. The act of pasteurization kills harmful organisms that may cause disease. Louis Pasteur first developed the process in 1864. The issue with pasteurized milk is that after being pasteurized, milk offers next to nothing in terms of real nutritional value, which is why milk is fortified with vitamins and minerals. Because the homogenization and pasteurization process kills enzymes, most fat-soluble vitamins are destroyed. Vitamins A, C, B6, and B12 are also significantly reduced.

As a result, milk proteins that would have been beneficial for health can now affect the body adversely. When consuming processed milk, you are consuming unnatural amino acids and synthetic nutrients.

Ironically, milk is pasteurized to remove harmful bacteria and organisms, but removing all the beneficial bacteria promotes other pathogens. Have you noticed that organic milk lasts much longer than conventional milk and that boxes of organic milk for children usually sit on market shelves instead of refrigerated ones?

Organic milk lasts a long time because of a process called ultra-high-temperature (UHT) processing. Milk is heated to 280 degrees for two to four seconds, killing any bacteria, whereas the standard pasteurization process subjects milk to a temperature of 145 degrees for thirty minutes or 160 degrees for at least fifteen seconds. Standard pasteurization doesn't kill all bacteria in milk, just enough

so that you don't get sick. UHT kills everything (including vitamins and minerals) and can sit on a shelf, unrefrigerated, for six months.

We can barely keep frozen breast milk for six months.

So why are the half-gallons of organic milk refrigerated?

Purely perception. We grew up buying milk from the refrigerated cases. Organic milk was sold at first from shelves, and it wasn't selling. Grocery stores put organic UHT milk in refrigerated cases, and we started buying organic milk. We choose organic to get healthier cow milk, but is it better?

Low-Fat Milk

When the fat is removed from dairy, it becomes less satiating and promotes overconsumption. Studies have shown that children who drink low-fat milk gain more weight than those who drink whole milk. Worse, after removing the fat, food companies replace it with sugar and artificial flavors to make it more palatable.[68]

I'll get into sugar later, but chocolate milk has 36 grams of sugar per 12 ounces. In comparison, Coke has 39 grams per 12 ounces.

Fat is among the healthiest nutrients in milk. Low-fat milk has no natural vitamin A or D or calcium. These vitamins and minerals are fortified or added back to processed milk to provide a small semblance of the milk it once was. When you consume pasteurized milk, you consume milk that contains synthetic vitamins added during the processing that strips it of all good bacteria.

Federal law requires processors to add vitamins A and D to milk because removing the fat removes these two essential vitamins. But adding fat-soluble vitamins like A and D to fat-free milk is pointless—you need fat to digest these vitamins effectively.[69]

Natural Flavors

Most processed foods include “natural flavors” as an ingredient. What are they?

To be convenient, processed foods need to have a long shelf life. The preservation methods tend to reduce flavor, so food companies turn to natural and artificial flavors to enhance flavors after foods are processed.

According to the Food and Drug Administration’s definition, as published in the 2019 *Code of Federal Regulations*, “The term natural flavor or natural flavoring means the essential oil, oleoresin, essence or extractive, protein hydrolysate, distillate, or any product of roasting, heating or enzymolysis, which contains the flavoring constituents derived from a spice, fruit or fruit juice, vegetable or vegetable juice, edible yeast, herb, bark, bud, root, leaf or similar plant material, meat, seafood, poultry, eggs, dairy products, or fermentation products thereof, whose significant function in food is flavoring rather than nutritional.”

Does the FDA’s definition of natural flavors make sense?

I’ve read this paragraph many times now. It seems to say that anything that was once natural can be considered natural flavoring, never mind that these once-natural flavors are purified and extracted back into foods in a lab. There’s nothing natural about foods prepared in a lab.

Carrageenan

Carrageenan, extracted from a red seaweed called Irish moss, is used as a thickening, stabilizing, and gelling agent. It is commonly used in seed milk such as almond milk and deli meats, ice cream,

jelly, cottage cheese, poultry, and infant formula. The safety of carrageenan has been questioned since the late 1960s.

Carrageenan has been shown to trigger inflammation, cause damage to the digestive system, increase intestinal permeability, and cause gastrointestinal ulcers. Most studies have been performed on lab animals, but some studies show intestinal damage to epithelial tissue in humans.[70]

While there is no substantial evidence that processed carrageenan is carcinogenic, any damage to the gut can have severe health effects downstream. If you can find a carrageenan-free option, I'd take the safer bet and choose the nut milk or meat that doesn't contain carrageenan.

Cornstarch

Cornstarch is a powdered substance used to thicken soups and other liquids. Made from the endosperm of the corn kernel, it is also found in baked and fried foods. When cornstarch is mixed with liquids, it has the consistency of a paste. After the paste is mixed with food and eaten, it becomes a solid in the stomach and intestines.

Cornstarch can create blockages in the digestive system. It can also become a breeding ground for bacterial or fungal substances when exposed to moisture. Thus, every time cornstarch is consumed, you risk an increase in breakouts and inflammation. Other risks are weight gain, high blood pressure, anemia, constipation, ulcers, and diabetes.[71]

Try mixing water and a half cup of cornstarch. Let it sit for a while and then try to pull the cornstarch up from the bottom of the bowl. Do you notice how it's almost a solid? Imagine what that does to the

stomach, intestines, and the rest of the digestive system. And if the cornstarch comes from genetically modified corn—and it probably does—it can wreak havoc in the body.

Monosodium Glutamate

Monosodium Glutamate (MSG) is derived from the glutamate amino acid. The glutamic acid in MSG is made by fermenting starches and is chemically similar to glutamic acids in real foods. In Figure 3.13, you can see how glutamate can convert to glutamine and vice versa in the body.

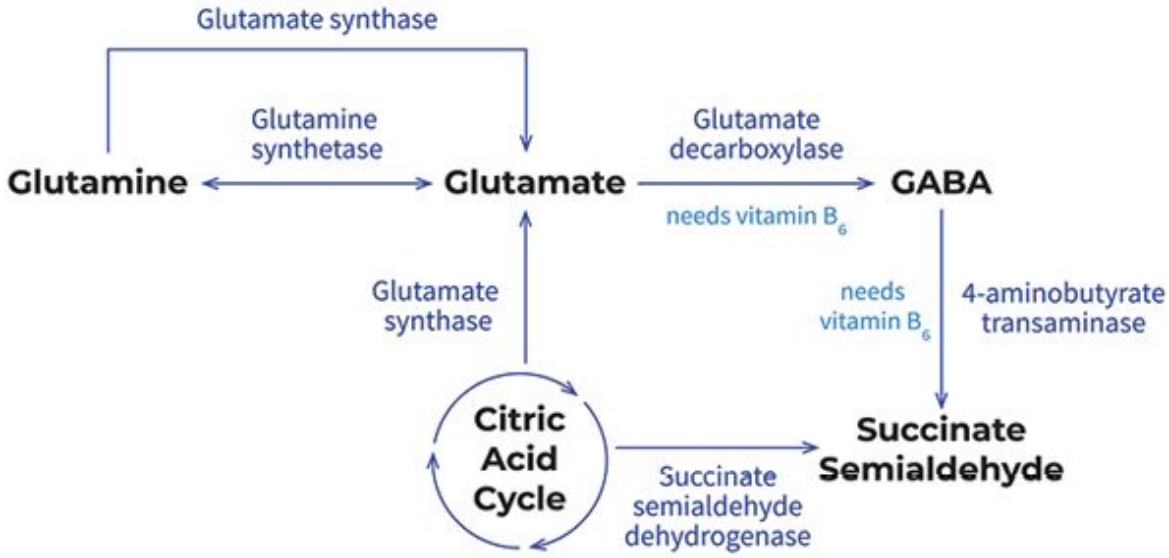
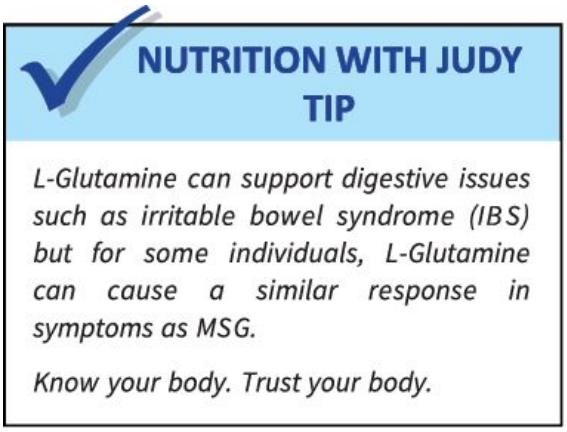


Figure 3.13. Glutamate Pathway.

I'll talk more about the importance of B6 in later chapters, but you can see the importance of B6 for the GABA pathway, a neurotransmitter that supports overall mood.

MSG is a flavor enhancer common in packaged foods, such as potato chips, dried jerkies, canned tuna, and bone broth; it is often used in vaccines. MSG enhances the savory, or umami, flavors of foods. Some people experience immediate adverse effects when

consuming foods with MSG. These include burning sensations or numbness of the head, mouth, and neck; headaches, hives or other skin conditions; rapid heartbeats; upset stomach; and weakness in the arms and legs.



Even if you don't have these physical symptoms, consuming MSG over time can overstimulate the nervous system, causing an inflammatory response. MSG is a neurotoxin (also called an excitotoxin) that causes cells to become overly excited and overly stimulated, to the point that they die.[72]

FOODS AND INGREDIENTS WITH MSG

Food manufacturers have made it increasingly difficult to identify foods with MSG. The following are ingredients that contain MSG:

- Bouillon
- Brewers' yeast
- Carrageenan
- Citric acid*
- Gelatin
- Glutamic acid
- Hydrolyzed plant protein
- Hydrolyzed soy protein
- Malted barley flour
- Maltodextrin
- Natural flavors (up to 20% MSG)*
- Pectin*
- Protease*
- Sodium caseinate
- Soy product*
- Soy protein isolate*
- Textured protein
- Ultra pasteurized*
- Whey
- Yeast extract

*may contain glutamic acid

Table 3.14. Foods and Ingredients with MSG.

Long-term consumption of processed MSG carries an increased risk of brain damage, weight gain, and hormonal issues. As an

excitotoxin, MSG can cause brain damage. MSG can also cause liver inflammation and dysplasia. Many foods with high levels of MSG are marketed to kids, such as packaged soups and dinner kits. A child's brain is four times more vulnerable to excitotoxic damage (death of brain cells) than adult brains.[73]

Food companies are well aware that consumers seek to avoid MSG and have been methodically labeling MSG under other names. We tend to think that MSG is only in Asian foods, but it is the most common flavor enhancer. It allows inexpensive foods to taste really good.

Next time a product says, "MSG free," make sure the label does not include any of the ingredients listed in Table 3.14.

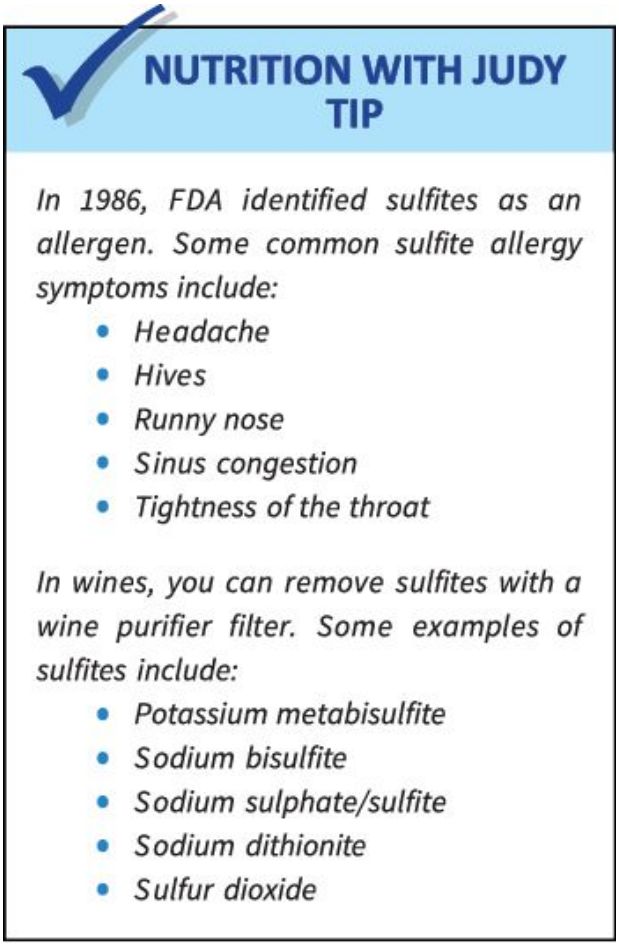
Soy Lecithin

Soy lecithin is a soy-based emulsifier that is in almost all packaged and processed foods. It helps stabilize ingredients and keep them from separating or becoming sticky.

Soy lecithin is made up of soybean oil and phosphatidylcholine. Soy lecithin is often made from genetically modified soybeans and bleached with hydrogen peroxide when made into lecithin.

Soy lecithin may cause cancer, congenital disabilities, food sensitivities that manifest as digestive problems, weight gain, skin conditions, dizziness, and blurred vision.[74]

Sulfites



Sulfites are sulfur-based compounds commonly found in dried fruits, wine, canned seafood, canned coconut milk, and white potatoes. Sulfites are preservatives and antioxidants that keep foods from becoming discolored and bacteria from spoiling foods. Sulfites are also in cosmetics, pharmaceuticals, and grapes.

Sulfite-free wine doesn't exist because sulfite occurs naturally in grapes. Red wines usually contain fewer sulfites than white wines and rosés. Organic wines also have fewer sulfites than conventional wine, but always check the label.

Some people have sulfite sensitivities, which may manifest as difficulty in breathing, and some sulfites may even cause deadly reactions by triggering an anaphylactic (IgE) response. Most asthma sufferers have sulfite sensitivities.[75]

The list of what not to eat is overwhelming. But if you remove packaged and processed foods, you remove most of these toxic ingredients and additives.

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Chapter 4

Sugars and Sweeteners: The Rise of Disease

Leave your drugs in the chemist's pot if you can heal the patient with food.

— Hippocrates

SUGAR IS A form of energy. It can provide energy for today, but sugar does not do much for longevity.

The Inuit community survives primarily on a carnivore diet. A large part of their diet is the seal and other animals such as caribou, bear, freshwater fish, birds, and eggs. Several Inuit communities rarely consume carbohydrates because few carbohydrate foods are available locally.[76]

The human craving for sugar is thought to be one of survival, which may be why kids love sugar. Their biological need is to survive today and grow quickly. This is fine when food is scarce, and carbohydrates are available only locally and seasonally, from fruit and vegetables.

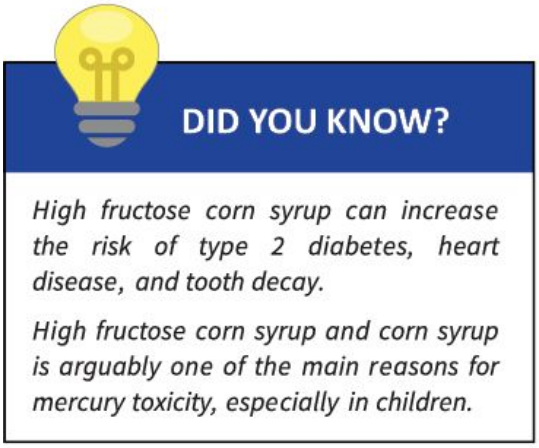
But today, this sugar craving is a critical player in all metabolic and modern-day diseases. We consume more sugar than our bodies are equipped to process. That's why diabetes, obesity, insulin resistance, and cardiovascular disease are on the rise.[77]

In 1822, Americans consumed an average of 9 grams of sugar (about 1.5 teaspoons) daily. In 2012, Americans consumed an average of 199 grams of sugar daily, or about 160 pounds of sugar

per person every year. The worldwide consumption is estimated at 174,000 metric tons.[78]

Carbohydrates Are Not Essential For Optimal Health

Carbohydrates and any forms of sugar are not required for optimal health. Let's talk a little bit about what carbohydrates do to the body.



Sugars such as glucose, sucrose, galactose, and fructose are short-chain carbohydrates. Long-chain carbohydrates get broken down into glucose in the digestive tract. Fiber is also a carbohydrate, and the human body doesn't have the capacity to break down fiber. However, the gut bacteria can extract nutrients from fiber as fuel and convert it into short-chain fatty acids. Some conventional practitioners argue that fiber is required for intestinal nutrients, such as butyrate. Butter has butyrate, or you can produce a type of ketone called beta-hydroxy-butyrate.[79]

Table sugar (sucrose) is made of the molecules, glucose and fructose. The entire body uses glucose and stores excess glucose in the liver and muscles. Any excess is stored as fat in the body. Fructose, on the other hand, bypasses the body and penetrates only

the liver—the only organ that can absorb it. Most of our processed foods contain fructose from high-fructose corn syrup. Excess consumption of processed foods becomes a strain on the liver.

FRUCTOSE ABSORPTION
• The absorption of real foods takes about 6–8 hours.
• Fructose can be absorbed in 60–90 minutes. The fast absorption causes a hormonal juggling act to manage blood sugar levels.
• Fructose effects belly fat. When our fat is exposed to fructose, it causes the adrenals to make more stress hormones (cortisol and cortisone).
• Fructose makes our blood sugar unstable and the result is a release of extra cortisol for several hours.

Table 4.1. Fructose Absorption.

High consumption of fructose or glucose can increase the body's requirements for vitamins B1, C, D, and the minerals calcium, magnesium, and chromium.

Fructose is the main carbohydrate in fruits and honey. Fruits and honey contain some glucose, but they typically are higher in fructose. When consuming processed snacks with fructose, high-fructose corn syrup, and juices, the fruit becomes another toxic fructose-load on the liver. The excess fructose becomes fat in the liver and damages it. This is how nonalcoholic fatty liver happens.

Glucose can easily be measured by bloodwork. Fructose is not as easily detected. Fructose does not initially raise blood sugars, so blood glucose monitors are not reliable reporters of blood sugar in a

person who consumes a lot of fruit and honey. Blood glucose monitors measure glucose, not fructose. Even if blood glucose numbers are not spiking, you might be getting too much fructose in your liver. Imagine what all that fructose does to your three-pound liver, which also has to store glucose, detox toxins, and perform a thousand other roles.[80] Figure 4.2 depicts the difference in how the body breaks down fructose and glucose.

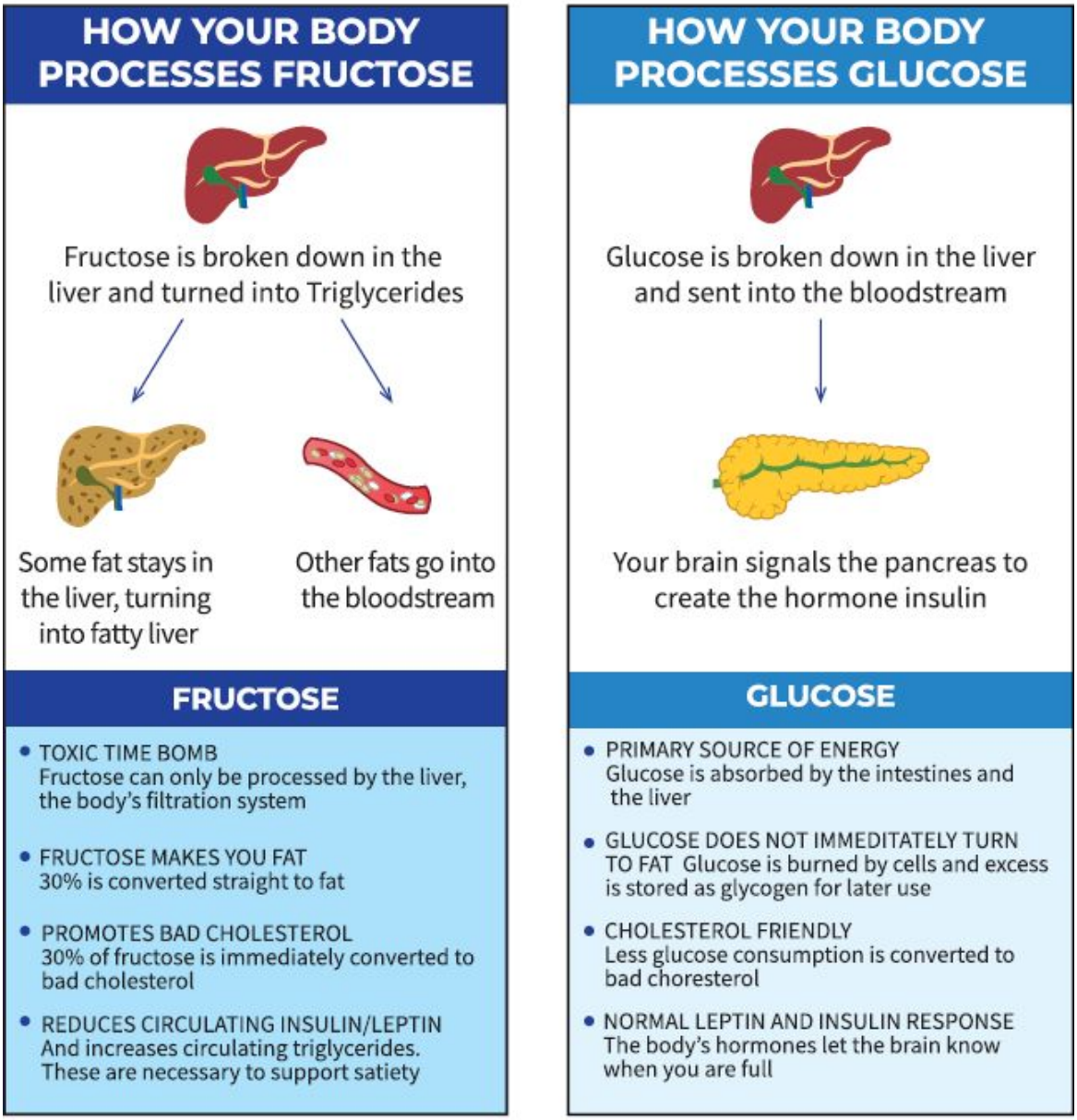


Figure 4.2. How the Body Processes Fructose and Glucose.

Does the importance of eating fruit to get their touted antioxidants outweigh the overload of fructose on the liver? Giving children extra fruit and fruit juice is dangerous if they are eating packaged foods that contain fructose and high-fructose corn syrup. The danger is developing nonalcoholic fatty liver disease.[81] You can see the composition of honey and other plant-based foods in Figure 4.3.

For a list of fruits and their fructose content, as well as other names for fructose, visit www.carnivorecure.com/nutrition.

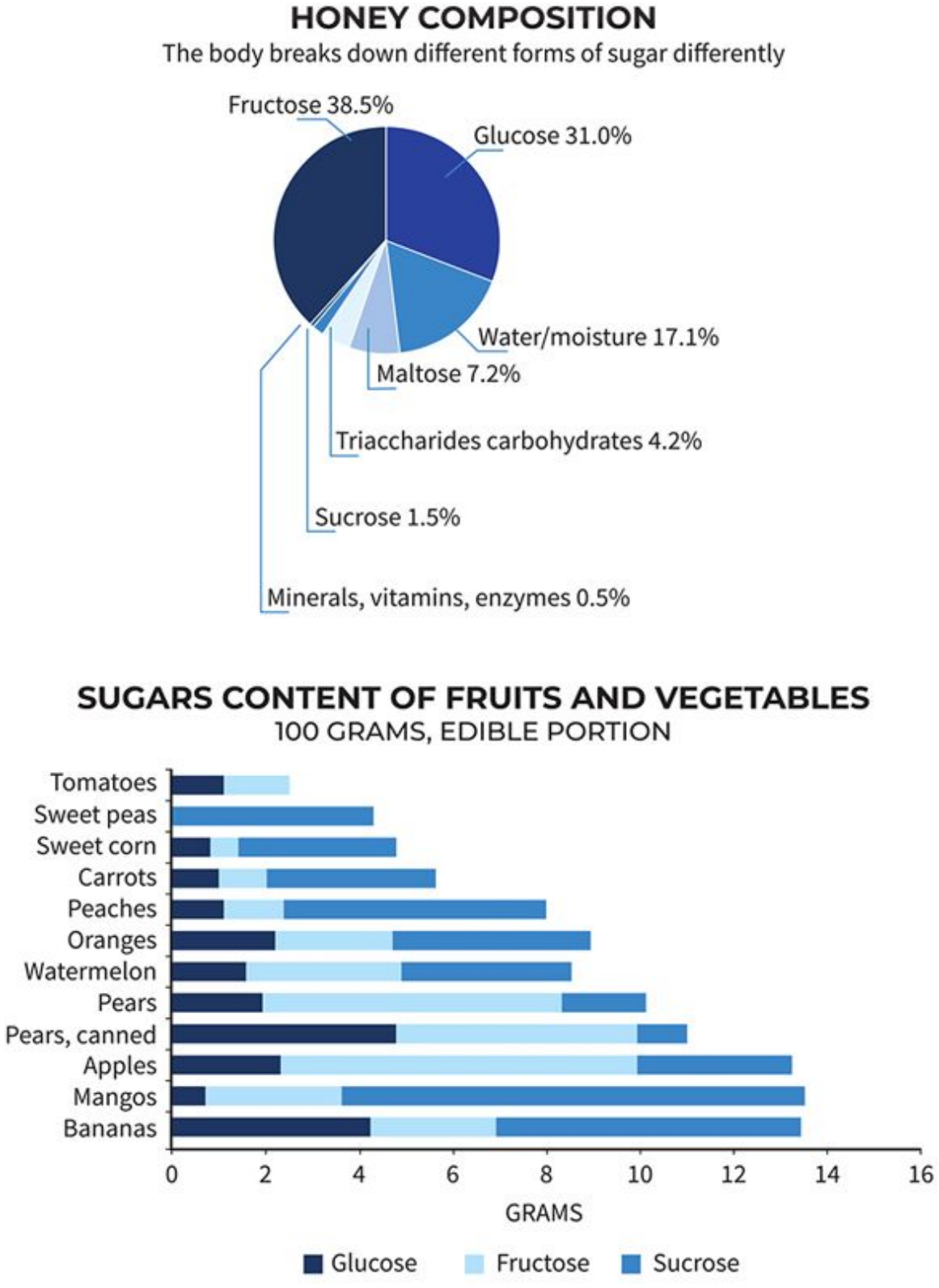


Figure 4.3. Composition of Honey.

Complex Carbohydrates: Friend or Foe?

Whole, unprocessed carbohydrates are considered healthy carbohydrates and include sweet potatoes, bananas, potatoes, brown rice, and legumes. Unfortunately, all these foods contain antinutrients, such as oxalates, phytic acid, and high amounts of fructose.

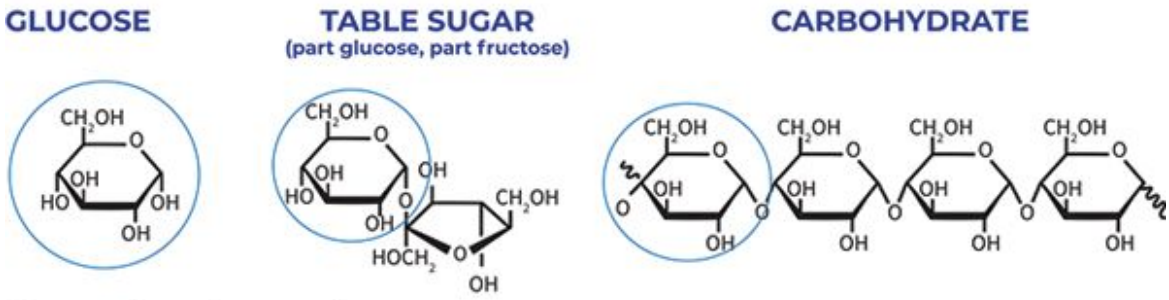


Figure 4.4. Sugar Compounds.

Refined carbohydrates are carbohydrates with the fibers removed. They've been altered by processing methods that strip away vital vitamins, minerals, and fatty acids. These refined carbohydrates include fruit drinks, white flour, white rice, white pasta, and pastries.

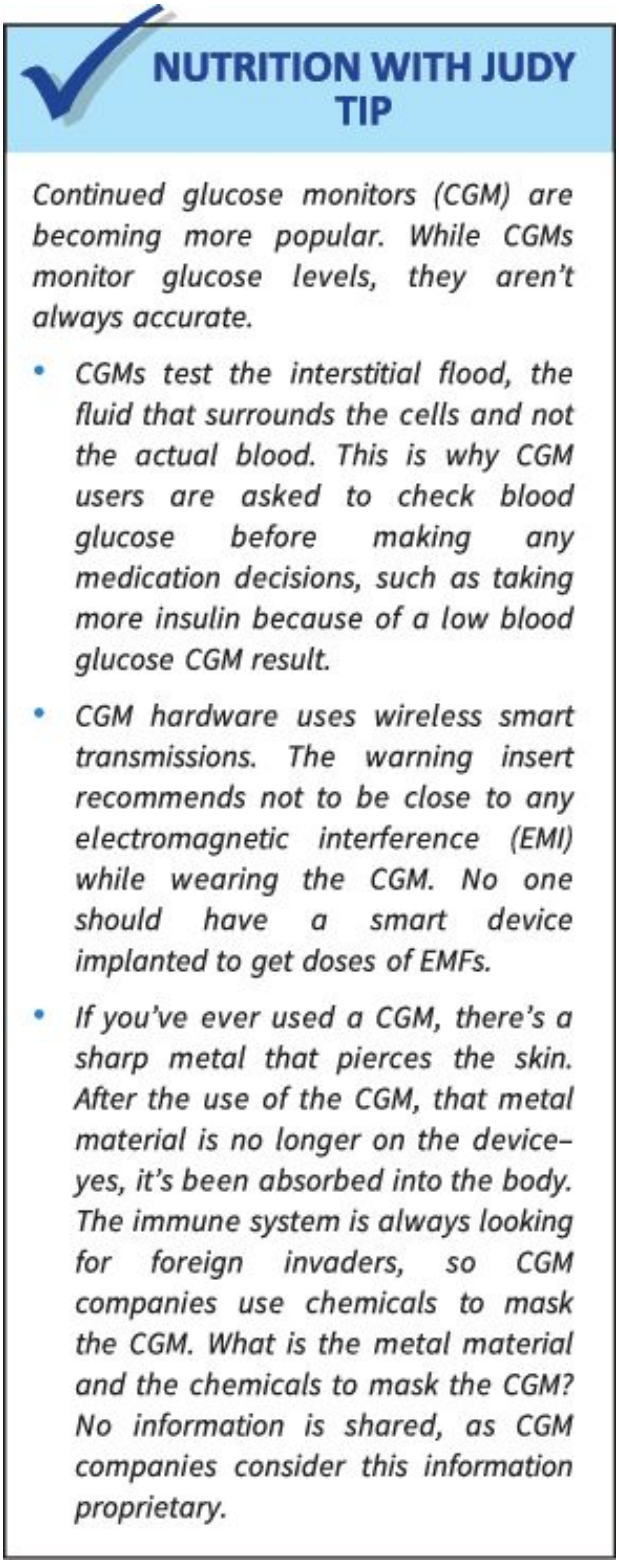
Standard nutritional recommendations always include complex carbohydrates. The reasoning is that the longer-chain complex carbohydrates take longer to digest and will have less effect on the blood sugar level in the body. In Figure 4.4, you can see how glucose, table sugar and complex carbohydrates are similar compounds. Even if this is technically true, it is a small point that is grossly exaggerated. The typical American diet includes more carbohydrates than the body needs. The body can store only about 2,000 calories worth of glucose in both the liver (100 to 120 g) and muscles (400 to 500 g). What the body cannot store as glucose, it will convert into fat.[82]

CHECKING BLOOD GLUCOSE	
Check how complex carbohydrates break down in the body. Try it with oatmeal and whole grains:	
1	To know your baseline, check blood glucose prior to eating
2	Check glucose one hour after eating
3	Check glucose two hours after eating
4	Repeat for different food types

Table 4.5. Checking Blood Glucose.

If you don't believe complex carbohydrates and sugars are similar, try a blood glucose challenge.

Choose a simple carbohydrate food and a complex carbohydrate food that have similar numbers of grams of carbohydrates and sugars. Eat each food separately and check your blood glucose level one to two hours after consuming each food (a glucose meter costs at least $20, and you'll have to prick your finger a few times).



A 2018 paper in *Nutrients Journal* looked at the effects of refined carbohydrates on coronary heart disease. The study found that

consuming refined carbohydrates led to an increased risk of cardiovascular disease as well as obesity.[83]

There's nothing complex about carbohydrates. They break down as sugars. They raise blood sugar and are high in antinutrients. Not all carbohydrates are equally bad, but that doesn't mean that any of them promote optimal health.

Essential Nutrients

Essential nutrients must be obtained from external sources because the body cannot make them and needs them for optimal health. Carbohydrates are not a dietary requirement, and no carbohydrate is essential. We may need glucose, but our bodies can make glucose from proteins and fats. Dietary fat breaks down to glycerol and fatty acids and is stored as triglycerides. If the body needs glucose, it can make it from fat and proteins (gluconeogenesis).

Digestion breaks proteins into amino acids, which build proteins for blood cells, connective tissue, bone, and muscle. The body cannot store extra amino acids, so that the liver will convert the excess amino acids into glucose. One study found that up to 50 percent of protein converts to glucose.[84] Eating unlimited amounts of protein is not a good thing.

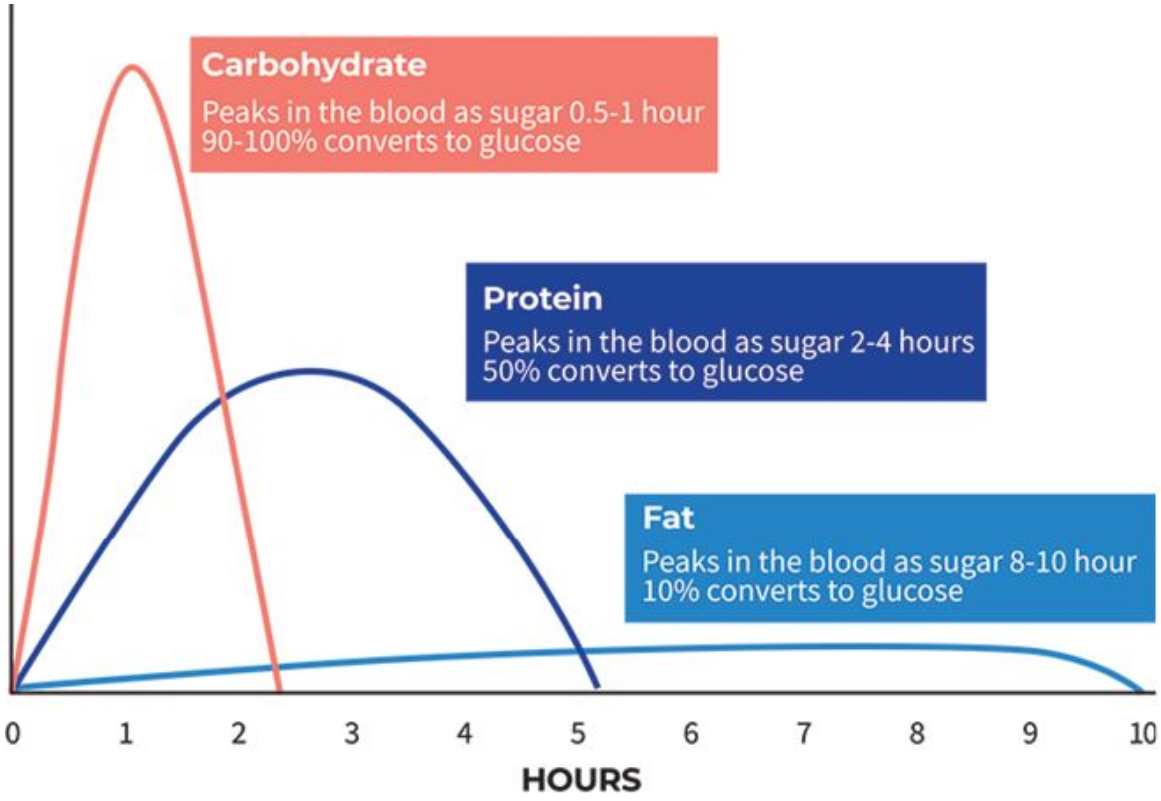


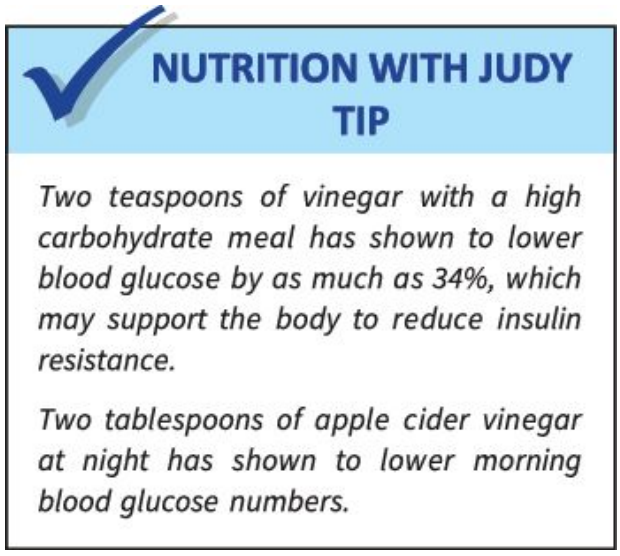
Figure 4.6. Nuttall, Frank Q., "Dietary Protein and the Blood Glucose Concentration," *Diabtetes*, 62(5), (2013): 1371-1372.

Digestion of refined carbohydrates requires the use of vitamins, minerals, and enzymes for proper metabolization. When consuming foods with minimal nutrients, the body uses any stored nutrients—which further depletes the body's net nutrient reserve.

Sugar in the Blood

The human body contains about five liters of blood at any given time. Its blood sugar range is carefully controlled at around 80 mg per deciliter (mg/dL). Mathematically, this works out to about 4 grams of sugar, which is less than a teaspoon. Someone who is prediabetic has glucose levels of about 100 mg/dL, about one teaspoon of sugar circulating in the blood. People diagnosed as diabetic have a fasting blood sugar level of more than 120 mg/dL; the amount of sugar in the blood is about 1.25 teaspoons.[85] This demonstrates that the

amount of sugar in the blood is carefully regulated: the difference between being healthy and being diabetic is only a quarter teaspoon of sugar (see Table 4.7).



When someone consumes too much sugar, their body goes into an emergency state. It has to prioritize shoveling away sugar in the bloodstream. The body prioritizes life or death matters and focuses on clearing excess sugar from the blood, so it uses up essential nutrients to produce insulin to clear glucose from the blood and fructose from the liver.

As I discussed in connection with allergies, processed foods high in sugar and made with inflammatory seed oils weaken the gut and make it permeable. With the immune system fighting these toxic foods, when we leave the house, our bodies can't handle the external toxins. Seasonal allergies don't just get worse with age—they get worse because of years of compromised gut health and subsequently declining immune health. Support the gut, eat nutrient-dense foods, and consume less sugar. You may be less bothered by seasonal allergies.

SHOW MY MATH: ONE TSP OF SUGAR IN THE BLOOD	
1	1 mg is equal to 0.0002 teaspoons
2	If you are prediabetic, a blood glucose of 100 mg/dL, that's 100 * 0.0002 which is 0.02 teaspoons
3	100 mg/dL which is 0.02 teaspoons
4	0.02 teaspoons * 10 dL = 0.2 tsp/L
5	There are 10 dL in 1 Liter
6	There are 0.2 teaspoons of sugar (step 3) in 1 L of blood (step 4)
7	If you multiply 0.2 teaspoon into 5 total liters of blood in the body, it comes out to 1 tsp of sugar in the body 0.2 tsp * 5L = 1 tsp

Table 4.7. Show My Math: One Teaspoon of Sugar.

Effects of Sugar Consumption

Sugar consumption is the primary cause of dental decay and bone loss. Sugar consumption causes phosphorous levels in the body to drop and calcium levels in the blood to rise. The drop in phosphorous levels then hinders the absorption of calcium, making it unusable and therefore toxic. Sugar consumption causes tooth decay not only because it promotes bacterial growth in the mouth, but because it alters the internal body chemistry.[86]

As soon as the body is fed refined sugar, the performance of its white blood cells—the immune system—is impaired. Obese people have more white blood cells, indicative of an overreactive immune system and signs of inflammation. This means a higher risk of atherosclerosis (clogged arteries) and impaired glucose tolerance.

The immune system's first line of defense is its innate immunity, which protects the body from invading pathogens. Studies show that a high- sugar diet negatively impacts the innate immune system. There is a connection—not just correlation—between Type 2 diabetes and malfunctioning of the innate immune response.[87]

Too much sugar depresses the immune system. Limit sugar when you have a fever, which is indicative of your immune cells at work. You want your immune system to fight the good fight. If you consume sugar, you're essentially handicapping your immune system. (Watch out: most fever-lowering medications contain sugar.)

Your adrenal glands produce hormones that help regulate your immune system, metabolism, and stress response. Your adrenals produce cortisol, a steroid hormone. Cortisol is released during stress but also to manage blood sugar levels. But cortisol comes at a cost.

Remember, the human body prioritizes survival functions, and any large swings in blood sugar can be physically dangerous. When blood sugar levels are high, cortisol steals nutrients. Cortisol is made with cholesterol and uses a lot of B vitamins. B vitamins help prevent infections and support overall cell health. If the body doesn't have enough B vitamins, other bodily functions suffer.

By limiting sugar consumption, the body needs less cortisol for the digestion of sugar. The same goes for stress. If you're stressed or consume a lot of sugar, eat foods rich in cholesterol and B vitamins (animal foods). The adrenal glands also love to hoard salt, so take extra salt with your food. Your body will thank you for it.

Sugar Addiction

Many people have poor relationships with food, and much of the reason is the addiction to sugar. Low-carbohydrate advocates believe natural sweeteners such as stevia, erythritol, monk fruit, and allulose are safe alternative options.

But studies have shown that, while glucose may not spike in a person using stevia, their insulin does, in fact, increase. Insulin function in the body is what's important. And when it becomes resistant from too much stimulation, especially too much glucose, we get diabetes or other metabolic diseases. All foods stimulate insulin (fat minimally), but glucose increases insulin the most. (see Figure 4.8)[88]

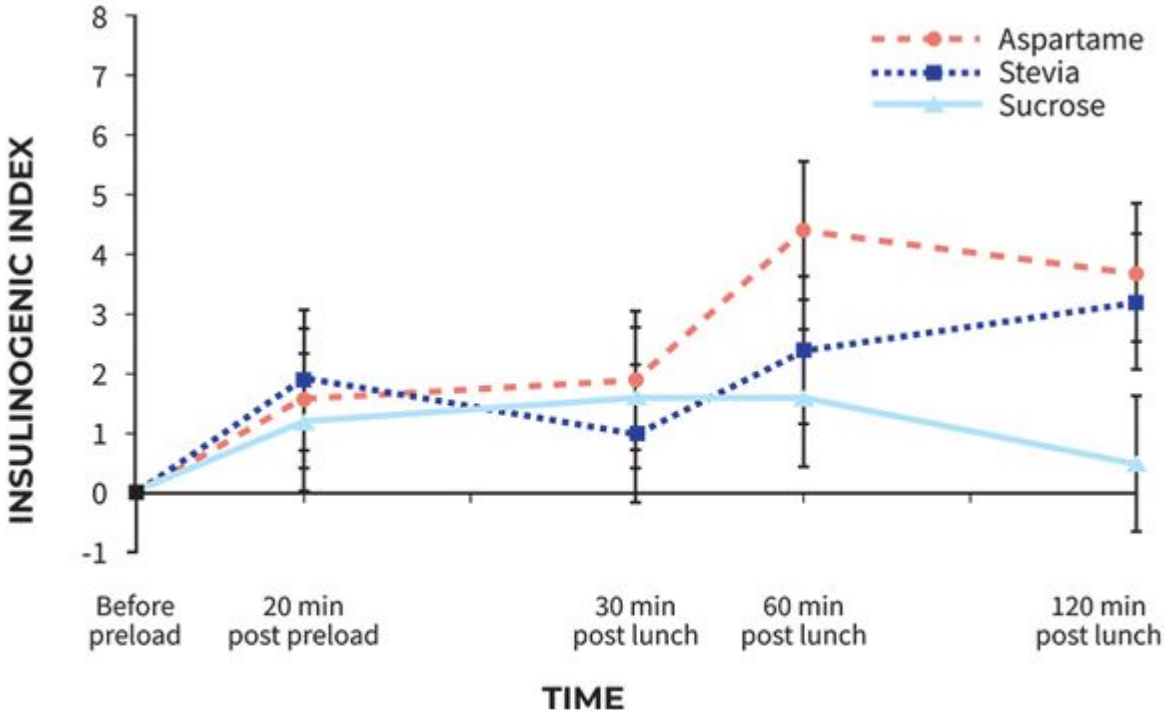


Figure 4.8. Anton, Stephen, et al., "Effects of Stevia, Aspartame and Sucrose on Food Intake, Satiety and Postprandial Glucose and Insulin Levels," Appetite, vol. 55, (2010): 37-43.

But assume for a moment that these sweeteners don't affect insulin. Let's look at some other aspects of sweeteners.

Do you know how the sweeteners erythritol and allulose are made? They are made from corn. The erythritol in your pantry is probably made from genetically modified corn, the same plant used to make high fructose corn syrup, corn syrup, and ethanol. How can this sweetener have no effect on glucose and fructose when it comes from the same plant used to make corn syrup? What finagling did food scientists do to make our brains taste something sweet while a blood glucose monitor shows no reaction by the body?[89]

CARBOHYDRATES IN SUGAR ALCOHOL SWEETENERS

Studies show that the body can only partially digest calories from sugar alcohols. Be wary as some low carbohydrate sugar alcohols have similar effects on blood sugars as white sugar. While erythritol and mannitol don't show an effect on glucose, there still is an effect on insulin.

Sugar shows a 64 glucose index out of 100 because half of sugar is fructose.

SUGAR/ SUGAR ALCOHOLS	CALORIES (PER 100G)	NET CARBS (PER 100G)	GLUCOSE INDEX
Sugar (sucrose)	• 387 calories	• 100 grams	• 64 GI
Erythritol	• 20 calories	• 5 grams	• 0 GI
Isomalt	• 210 calories	• 52 grams	• 9 GI
Lactitol	• 300 calories	• 75 grams	• 6 GI
Maltitol	• 270 calories	• 67 grams	• 36 GI
Mannitol	• 150 calories	• 37 grams	• 0 GI
Sorbitol	• 250 calories	• 62 grams	• 9 GI
Xylitol	• 300 calories	• 75 grams	• 13 GI

Table 4.9. Awuchi, Chinaza, "Sugar Alcohols: Chemistry Production and Nutritional Importance." *International Journal of Advanced Academic Research*, Vol. 3 (2017): 2.

To return to digestion, what happens when the brain registers the taste of carbohydrate-rich sugary foods, but the body finds no chemicals to process? How does that affect the digestive cascade?

Studies have found that when rats addicted to cocaine are given sugar; they ignore the cocaine and head for sugar. Another study

shows rats, held in a confined space, pulling a cord to get sugar. It's the only food they are fed. As the study progresses, the researchers open up the confined space, and these rats have access to various foods. However, these rats stay put and obsessively pull the cord for the sugar. Sugar consumes their attention and their life: they are addicted to sugar. Imagine what sugar does to children? As a society, we are consuming comparatively larger doses than these rats got in any of these studies.[90]

Solutions for overcoming all addictions have one commonality: abstention. All addictive habits, including recreational drugs, pharmaceutical drugs, alcohol, cigarettes, and pornography, require total abstention to kick the habit. But you can't completely abstain from food. You need food to survive, and you need the right foods to thrive. The inability to abstain from food is arguably why food addiction is the most difficult addiction to overcome.

DSM-5 and Food Addiction

If we correctly label sugar as an addictive substance, we may finally start the healing process of food addiction. The fifth edition of the American Psychiatric Association's official handbook, *Diagnostic and Statistical Manual of Mental Disorders* (DSM–5), defines substance use disorder as follows:

1. The substance is often taken in larger amounts or over a longer period than was intended.
2. There is a persistent desire or unsuccessful effort to cut down or control use of the substance.
3. A great deal of time is spent in activities necessary to obtain the substance, use the substance, or recover from its effects.

4. Craving, or a strong desire or urge to use the substance, occurs.
5. Recurrent use of the substance results in a failure to fulfill major role obligations at work, school, or home.
6. Use of the substance continues despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of its use.
7. Important social, occupational, or recreational activities are given up or reduced because of use of the substance.
8. Use of the substance is recurrent in situations in which it is physically hazardous.
9. Use of the substance is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance.
10. Tolerance, as defined by either of the following:

    a. A need for markedly increased amounts of the substance to achieve intoxication or desired effect
    b. A markedly diminished effect with continued use of the same amount of the substance.
    c. Withdrawal, as manifested by either of the following:
    d. The characteristic withdrawal syndrome for that substance (as specified in the DSM-5 for each substance).
    e. The use of a substance (or a closely related substance) to relieve or avoid withdrawal symptoms.[91]

The symptoms associated with substance use disorders are defined as falling into four groupings:

1. Impaired control
2. Social impairment
3. Risky use
4. Pharmacological criteria (e.g., tolerance and withdrawal)

The *DSM-5* chapter, “Substance-Related and Addictive Disorders,” makes clear that substance use per se is not required for the diagnosis of addiction, for example, addiction to gambling. And although gambling is now considered a behavioral addiction, sugar is not. Food addiction is listed with behavioral addictions like video games and exercising, but these problems are considered more descriptive and are less recognized clinically. Sugar is grouped with these behavioral addictions, even though numerous studies show sugar’s addictive effect on the brain and body.

The DSM-5 lists nine types of substance-use addictions, including alcohol, tobacco, caffeine, cannabis, street drugs (hallucinogens, PCP, cocaine, opioids) inhalants, and prescription drugs (reference Table 4.10).

The definition of a substance-related issue in the *DSM-5* considers that someone has a substance addiction if they exhibit a “problematic pattern of use [of] an intoxicating substance that leads to clinically significant impairment or distress with 10 or 11 of the above criteria, occurring within a 12-month period.”[92]

DIAGNOSTIC AND STATISTICAL MANUAL OF MENTAL DISORDERS, 5TH ED. (DSM-5)

LIST OF ADDICTIONS – SUBSTANCES

Substance use disorders in the DSM-5 provide a list of addictions relating to the following substances.

- Alcohol
- Tobacco
- Opioids (like heroin)
- Prescription drugs
- Cocaine
- Cannabis (marijuana)
- Amphetamines
- Hallucinogens
- Inhalants
- Phencyclidine (PCP)
- Other unspecified substances

LIST OF IMPULSE CONTROL DISORDERS

DSM-5 lists disorders where impulses cannot be resisted, which could be considered a type of addiction. The following is a list of the recognized impulse control disorders.

- Intermittent explosive disorder (compulsive aggressive and assaultive acts)
- Kleptomania (compulsive stealing)
- Pyromania (compulsive setting of fires)
- Gambling

LIST OF ADDICTIONS – BEHAVIORAL

It has been suggested one of the types of addictions is behavioral addiction. The following is a list of behaviors that have been noted to be addictive:

- Food (eating)
- Sex
- Pornography
- Using computers / the internet
- Playing video games
- Working
- Exercising
- Spiritual obsession (as opposed to religious devotion)
- Pain (seeking)
- Cutting
- Shopping

Table 4.10. American Psychiatric Association, "Diagnostic and Statistical Manual of Mental Disorders," (DSM-5).

DSM 5 SUBSTANCE USE DISORDER CRITERIA AND POSSIBLE CORRESPONDING FOOD ADDICTION CRITERIA

Disorders are defined based on the following criteria. Symptoms must occur within the past 12 months. Severity is specified as mild (2-3 symptoms), moderate (4-5), and severe (6+ symptoms).

	SUBSTANCES							FOOD	
	Alcohol	Caffeine	Cannabis	Halluci-nogens	Inhalants	Opioids	Sedatives		
Substance Use Disorder Criteria*								**Possible Food Addiction Equivalents**	**Note**
1 Substance often taken in larger amounts or over a longer period than intended	✓	X	✓	✓	✓	✓	✓	1 Food consumed in larger amounts or over a longer period than intended	Empirically supported
2 Persistent desire or unsuccessful efforts to cut down or control substance use	✓	X	✓	✓	✓	✓	✓	2 Persistent desire or unsuccessful efforts to cut down or control food intake	Empirically supported
3 Great deal of time is spent in activities necessary to obtain or use the substance or recover from its effects	✓	X	✓	✓	✓	✓	✓	3 Great deal of time is spent in activities necessary to obtain or overeat on foods or recover from its effects	Plausible
4 Craving, or a strong desire or urge to use the substance	✓	X	✓	✓	✓	✓	✓	4 Craving, or a strong desire or urge to eat specific foods	Empirically supported
5 Recurrent substance use resulting in a failure to fulfill major role obligations at work, school, or home	✓	X	✓	✓	✓	✓	✓	5 Recurrent overeating despite having social problems caused or worsened by specific foods	Plausible
6 Continued use despite recurrent social or interpersonal problems cause or exacerbated by the effects of the substance	✓	X	✓	✓	✓	✓	✓	6 Continued overeating despite recurrent social or interpersonal problems causes or exacerbated by the effects of specific foods	Plausible
7 Important social, occupational, or recreational activities are given up or reduced because of substance use	✓	X	✓	✓	✓	✓	✓	7 Important social or occupational, activities are given up or reduced because of overeating on foods	Plausible
8 Recurrent substance use in situations in which it is physically hazardous	✓	X	✓	✓	✓	✓	✓	8 Recurrent overeating in situations in which it is physically hazardous	Plausible in acute health condition
9 Substance use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance	✓	X	✓	✓	✓	✓	✓	9 Overeating is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by overeating on foods	Empirically supported
10 Tolerance: a. need for markedly increased amounts of the substance to achieve intoxication or desired effect b. markedly diminished effect with continued use of the same amount of the substance	✓	X	✓	✓	✓	✓	✓	10 Tolerance: a. need for markedly increased amounts of foods to achieve desired effect b. markedly diminished effect with continued use of the same amount of food	Plausible
11 Withdrawal: a. Withdrawal syndrome (differs by substance) b. Substance is taken to relieve or avoid withdrawal symptoms	✓	✓	✓	X	X	✓	✓	11 Withdrawal: a. Withdrawal syndrome when refraining from eating specific foods b. Specific foods are eaten to relieve or avoid withdrawal symptoms	Plausible, but hard to distinguish from energy deficit

Note: *Empirically supported* refers to evidence that can be observed with eating behaviors in humans based on different assessment methods. *Plausible* refers to evidence that can be observed with eating behaviors based on animal studies, anecdotal reports, or self-reports such as Yale Food Addiction Scale.

Table 4.11. IBID 4.10, APA, DSM-5.

Table 4.11. DSM-5 Substance Use Disorder Criteria and Food Addiction Criteria.

The impairment is considered mild if the client exhibits two or three of the criteria, moderate if they demonstrate four or five, and severe if they have six or more symptoms.

When it comes to sugar, most of the population will fall into the clinically significantly impaired or severely impaired categories. Again, sugar is not listed as one of the nine types of substance addictions in the *DSM-5* (reference Table 4.11).

However, the Yale Food Addiction Scale does take sugar into account. The twenty-five-question scale devised by Yale's Rudd Center for Food Policy and Obesity defines food addiction using the *DSM*'s substance dependence criteria and focuses on processed foods, as well as foods with a high fat and high sugar content.[93]

Diabetes is ultimately a disease of high blood sugar. Don't be part of the alarming rise of Americans with diabetes (reference Figure 4.12 on next page). If you limit the sugar you put into your body (which means all carbohydrates), you are less likely to develop prediabetes, diabetes and other metabolic diseases.

Cut sugar and sweeteners, especially if you have an emotional relationship with food. As long as these sugars and sweeteners remain in your body, you may never heal your relationship with food. Removing sugars and sweeteners just may be a game changer.[94]

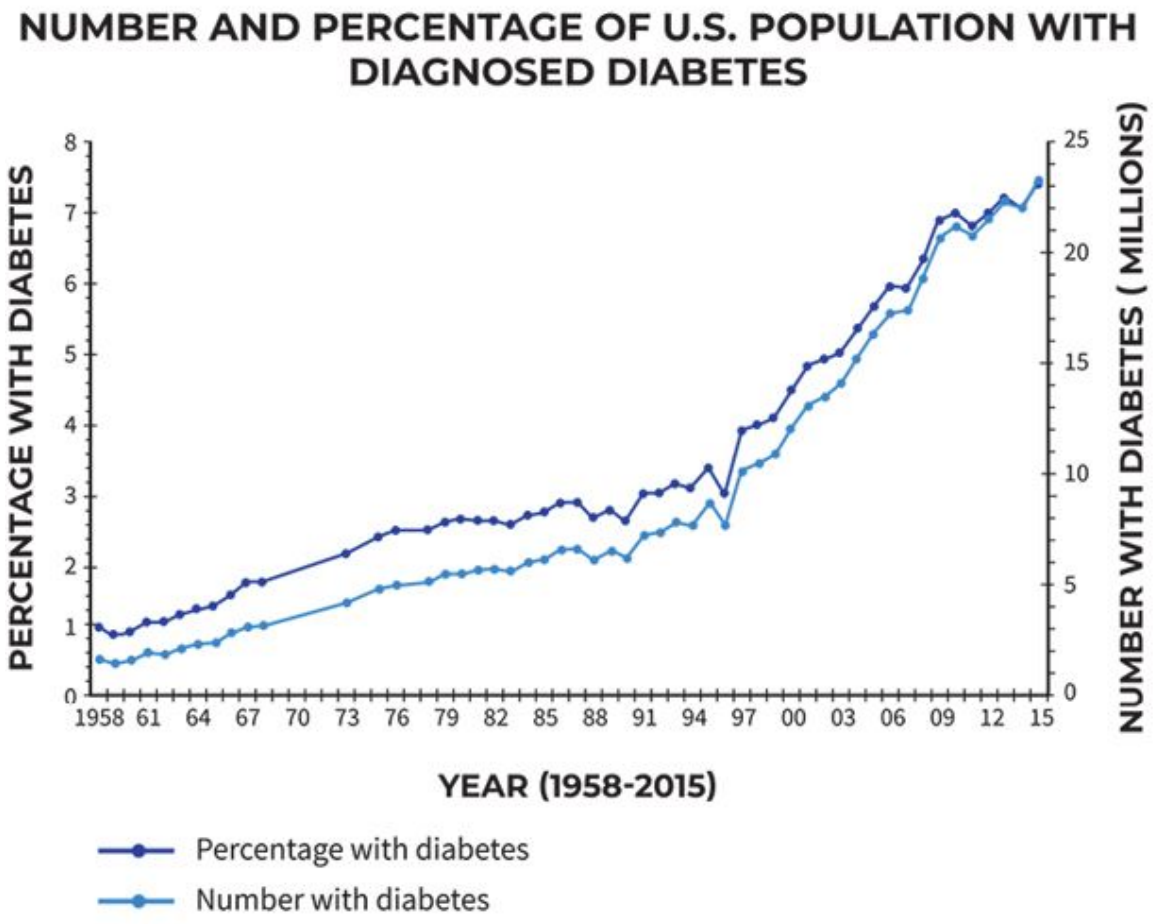


Figure 4.12. Decoster, Sam, et al., "Endocrine-Disrupting Chemicals;" *Journal of Environment and Public Health*, 8, (2012): 713.

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Chapter 5

Genetically Modified Foods

The world as we have created it is a process of our thinking. It cannot be changed without changing our thinking.

—Albert Einstein

MAYBE YOU'RE READY to limit sugary foods and carbohydrates. What about vegetables? Vegetables contain some carbohydrates.

Most vegetables are grown with pesticides and herbicides. One of these herbicides is glyphosate. Glyphosate is dangerously toxic and has been found in many breakfast cereals, such as Cheerios.[95] This is such an important topic that it needs a chapter of its own.

What Glyphosate Is

Monsanto introduced the herbicide glyphosate in 1974. Reregistration was completed in 1993, and glyphosate is now the number one synthetic herbicide for agriculture, lawns, gardens, and weeds. It is the main ingredient in the herbicide Roundup. Genetically engineered crops account for an estimated 56 percent of global glyphosate use because they've been genetically modified to tolerate Roundup. Many Americans use a Roundup spray on their lawns that kills only the weeds.[96] Table 5.1 discusses genetically modified organisms and plant-based food examples.

WHAT IS A GENETICALLY MODIFIED ORGANISM?

A genetically modified organism (GMO) is a plant, animal or other organism whose genetic makeup has been modified in a laboratory using genetic engineering or transgenic technology. This creates combinations of plant, animal, bacterial and virus genes that do not occur in nature or through traditional crossbreeding methods.

In order for a product to be Non-GMO Project Verified, its inputs must be evaluated for compliance.

RISK LEVEL	DEFINITION	EXAMPLES
High risk	• The input is derived from, contains derivatives of, or is produced through a process involving organisms that are known to be genetically modified or commercially available.	• Alfalfa, Animal products, Canola, Corn, Cotton, Microbes, Papaya, Potato, Soy, Sugar beet, Yellow summer squash, Zucchini
Low risk	• The input is not derived from, does not contain derivatives of, or is not produced through a process involving organisms that are presently known to be genetically modified and commercially available.	• Avocados, Sesame seeds, Spinach, Tomatoes
Non-risk	• The input is not derived from biological organisms and not, therefore susceptible to genetic modification.	• Avocados, Sesame seeds, Spinach, Tomatoes
Monitored risk	• The Non-GMO Project carefully monitors the development of new genetically engineered products. • The following products will soon have widespread contamination of GMOs or have known instances of contamination from GMOs.	• Apple, Camelina (false flax), Flax, Mushroom, Mustard, Orange, Pineapple, Rice, Salmon, Sugarcane, Tomato, Wheat
Commodity crops	• GMO crops often are used as commodity crops that get further processed into a variety of ingredients. These high risk ingredients are typically present in packaged products.	• Alcohol, Amino acids, Ascorbic acid, Aspartame, Citric acid, Ethanol, Flavorings (natural and artificial), High fructose corn syrup. Hydrolyzed vegetable protein, Lactic acid, Maltodextrin, Molasses, Monosodium glutamate (MSG), Sodium ascorbate, Sodium citrate, Sucrose, Textured vegetable protein (TVP), Xanthan gum, Vinegar, Vitamins, Yeast products

Table 5.1. Genetically Modified Organisms.

Since 1974, more than 3.5 billion pounds (1.6 billion kilograms) of glyphosate have been used in the United States—that's 19 percent of all glyphosate used globally.

Monsanto introduced the Roundup Ready soybean in 1996, and Roundup-resistant corn, canola, alfalfa, and cotton soon followed. These crops are genetically modified to withstand direct applications of Roundup. Roundup kills just about everything else.

Glyphosate use is also increasing the proliferation of superweeds resistant to all herbicides. *Food and Water Watch's* 2013 report found the use of herbicide-resistant crops has led to the increasing use of more dangerous herbicides.[97]

Fifty-six percent of all glyphosate is used on glyphosate-tolerant crops. Although glyphosate was introduced forty-five years ago, 67 percent of glyphosate has been sprayed in the last ten years, according to a 2019 report by Dr. Charles Benbrook, an agricultural economist. If you like numbers, 14.8 billion pounds (6.7 billion kilograms) of glyphosate have been sprayed globally in the last decade on Roundup Ready crops, which are sterile (their seeds are often called terminator seeds). Each year, farmers need to purchase the most recent strain from Monsanto because seeds from the previous year's crop won't germinate.[98]

It's a genius business model. Every customer is a repeat customer.

Recent Glyphosate Research and Lawsuits

The Environmental Protection Agency's 2016 review of glyphosate states that it is "not likely to be carcinogenic to humans at doses relevant to human health." But studies published in 2019 alone question the validity of the EPA's classification. (reference Table 5.2)[99]

Monsanto’s lawyers are being kept busy by the many lawsuits against the company because of Roundup. More than eleven thousand people have sued Monsanto, now Bayer, because the plaintiffs developed non-Hodgkin’s lymphoma, a blood cancer. The first two trials established that Roundup is a substantial contributing factor in developing non-Hodgkin’s lymphoma, and plaintiffs were awarded large sums for actual and punitive damages.[100]

RESEARCH AGAINST GLYPHOSATE	
TIMELINE	**PUBLISHINGS**
January 2019	• An analysis published in Environmental Sciences Europe argues that the U.S. EPA's classification of glyphosate disregarded substantial scientific evidence of genotoxicity (the negative impact on a cell's genetic material) associated with weed killing products such as Roundup.
February 2019	• A new meta-analysis published in Mutation Research/Reviews in Mutation Research reported a "compelling link" between glyphosate-based herbicides and non-Hodgkin lymphoma. Three of the study authors were members of the EPA's scientific advisory panel on glyphosate who have stated publicly that the EPA failed to follow proper scientific practices in its glyphosate assessment.
March 2019	• A study published in the International Journal of Epidemiology analyzed data from more than 30,000 farmers and agricultural workers from studies done in France, Norway and the U.S., and reported links between glyphosate and diffuse large B-cell lymphoma.
April 2019	• The U.S. Agency for Toxic Substances and Disease Registry issued its draft toxicological profile for glyphosate. The report confirms increased cancer risk from glyphosate exposures.

Table. 5.2. Research Against Glyphosate.

Dewayne Johnson, a groundskeeper for a school in California, was the first to win a Roundup case against Monsanto and was awarded $289 million by the jury, including $250 million in punitive damages, in 2018. Some days he mixed and sprayed 150 gallons of glyphosate and once was accidentally drenched in it. Although told in

a training session, it was “safe enough to drink,” he developed non-Hodgkin’s lymphoma. After several tests, his doctors concluded that glyphosate was to blame.[101]

Although the trial judge observed that Monsanto “acted with malice, oppression, or fraud, and should be punished for its conduct,” she later reduced Johnson’s award to $78 million because of a technicality, and Monsanto appealed the verdict.[102] The Court of Appeals for the First Appellate District of California sided with Johnson in July 2020 but reduced his award to $20.5 million, half in compensatory and half in punitive damages. “In our view, Johnson presented abundant—and certainly substantial—evidence that glyphosate, together with the other ingredients in Roundup products, caused his cancer,” the appellate court said. “Expert after expert provided evidence both that Roundup products are capable of causing non-Hodgkin’s lymphoma … and [that it] caused Johnson’s cancer in particular.” Bayer said it was considering an appeal to the Supreme Court of California.[103]

Glyphosate Exposure

Dewayne Johnson was a school’s groundskeeper. The half-life of Roundup (the time required for Roundup to reduce to half its value) is 47 days. Johnson sprayed where kids play daily. Roundup is also sprayed in most public parks. Figure 5.3 depicts California and New York public parks and schools that use glyphosate.[104]

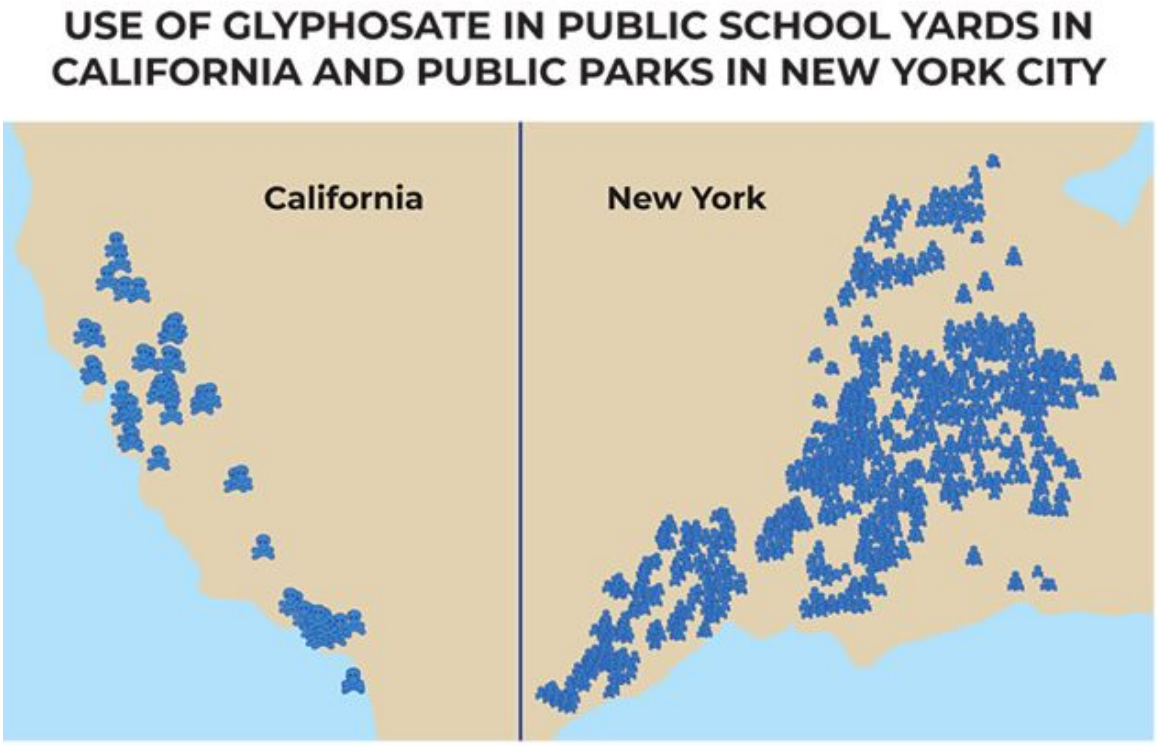

Figure 5.3. Seneff, Stephanie, "Glyphosate Correlations with Disease," U.S. Congressional Hearing, (2016).

If you have children and pets who play in your yard, you'll want to switch to more natural sprays. If your kids dig in the dirt or stomp on dirt, they are exposed to glyphosate. My home has more weeds growing between the bricks in the walkway than I'd like, but knowing that my kids can play in the yard without the risk of pesticide exposure makes it worth tolerating the weeds.

Glyphosate is also sprayed on crops right before harvest. Farmers use glyphosate to even out and speed up the drying of wheat before harvest, known as desiccation.

Because the list of genetically modified crops list is long, the safest bet for limiting glyphosate exposure is to consume only 100 percent organic foods. But U.S. law allows 5 percent of even foods with an organic label (without the 100 percent claim) to be comprised of nonorganic ingredients.[105]

Some glyphosate foods include, but are not limited to, all foods containing ingredients from genetically modified crops and foods derived from them, such as canola oil, soybean oil, rice milk, multigrain chips, popcorn, packaged goods, corn syrup, nonorganic fruits and vegetables, nuts, and commercial animal feed. Various resources offer detailed lists, but no list will ever be comprehensive.[106]

Glyphosate and the Shikimate Pathway

We know that processed foods and inflammatory seed oils cause damage to our microbiome by causing leaky gut, even autoimmune disease. But what if a more significant variable is lurking in this equation?

Glyphosate is able to kill weeds—and any plants—by blocking a part of the plant called the shikimate pathway. The shikimate pathway is how plants synthesize aromatic amino acids—phenylalanine, tyrosine, and tryptophan—and if you block this part of the plant's biology, the plant dies. Glyphosate inhibits the action of the enzyme that produces these aromatic amino acids.

Humans and animals cannot make these amino acids; we get these essential amino acids from the foods we eat. Glyphosate is considered safe for humans because human cells (and animal cells) do not have a shikimate pathway.[107] However, bacteria do have a shikimate pathway.[108]

Figure 5.4 provides a graphic representation of the shikimic acid pathway.

The shikimic acid pathway occurs in plants, bacteria, fungi, algae, and some protozoan parasites. This is how glyphosate kills plants that are not Roundup-DNA'ed.

In case you missed it, the shikimic acid pathway also occurs in bacteria.

Yes, our bacteria. Our gut, skin and everything-else bacteria.

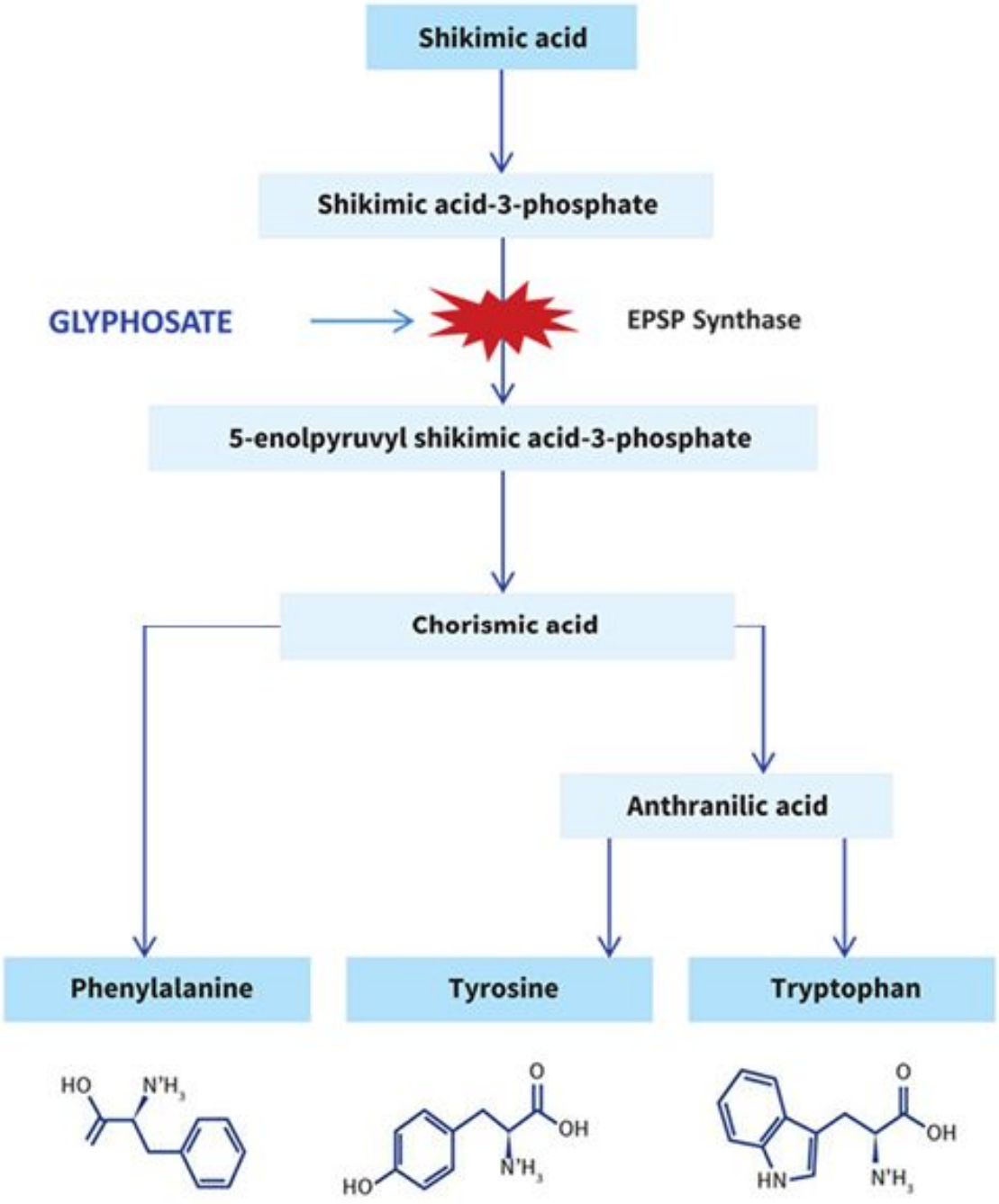

Figure. 5.4. Glyphosate and the Shikimate Pathway.

Glyphosate's Antibacterial Properties

As I've discussed, the gut microbiome contains trillions of bacteria that help humans digest foods properly and are vital to human health.

Many studies have shown that an imbalance of beneficial bacteria in the gut has significant effects on human health. Our bacteria are dependent on their shikimate pathway, which is inhibited by glyphosate.[109]

The good bacteria in the human microbiome are essential for optimal health. And remember, the gut holds at least 70 percent of the immune system. When the body is exposed to glyphosate, the harm it does to good bacteria also harms the immune system. Couple this with a high-carbohydrate, high-sugar diet that also adversely affects the immune system, and the human body is fighting an impossible battle.

Is it any wonder we all need support from probiotics and other aids to foster the growth of good gut bugs for our microbiome?

Advocates of genetically modified crops say this argument is weak. One study shows that, given the abundance of aromatic amino acids, glyphosate does not have an antimicrobial effect on the body. Essentially, they say, the bacteria cells in the body are fine.[110]

But what if the body doesn't have enough aromatic amino acids? The researchers write, "We conclude that sufficient intestinal levels of aromatic amino acids provided by the diet alleviates the need for bacterial synthesis of aromatic amino acids and thus prevents an antimicrobial effect of glyphosate in vivo. It is, however, possible that the situation is different in cases of human malnutrition…"[111]

What if you are vegetarian or vegan and have insufficient amounts of these amino acids from your diet? What if you eat insufficient amounts of protein? What if you have a damaged gut and can't break the proteins down to have sufficient aromatic amino acids?

Even if the body's bacteria protected it against glyphosate with these aromatic amino acids, what about the other functions in the body that require these aromatic amino acids (tryptophan is needed to boost serotonin levels)? If glyphosate uses up all the body's tryptophan, does serotonin production suffer?

I am not a biologist or chemist, and I'm sure that advocates of GMO crops can argue the nuances, but if you have to argue why it's safe to eat some chemicals, something is alarmingly wrong with the way food is sourced. Some champions of GMO crops even argue that the amounts of glyphosate allowed on crops are too small to affect our health.[112]

When you consider that glyphosate is in our waters, our foods, and the land we walk and play on, the calculations of glyphosate exposure are inaccurate.

Paul Mills, a professor of public medicine and human health at the University of California San Diego, has tracked adults older than fifty since 1996 and measured their urine samples for glyphosate. Mills' research shows that glyphosate levels have increased 1,208 percent.[113]

Is it hard to believe that low-level exposure for more than twenty years causes digestive problems and other health issues today?

WHAT FOODS CONTAIN THESE THREE AMINO ACIDS?	
AMINO ACID	**SOURCES**
Phenylalanine	• Many foods contain phenylalanine. Soy is probably the best plant version. Be wary as soy is one of the most genetically modified foods, meaning they have significant exposure to glyphosate. • Beef, chicken, fish, pork, cheese, eggs and milk are all good options.
Tyrosine	• Chicken, fish, turkey, milk, yogurt and cheese are all great options. Soy products are a good vegetarian option but as mentioned, while soy may be a good option for tyrosine, certain soy products are far from being a nutrient-dense food.
Tryptophan	• Tryptophan is a very important aromatic amino acid as it helps boost serotonin. Serotonin is a neurotransmitter that is known for its effects on overall well-being and happiness. • Salmon, chicken, goose, turkey and eggs are good options. Soy is an option but not recommended.

Table 5.5. Foods that Contain Phenylalanine, Tyrosine, Tryptophan.

Even if glyphosate were banned tomorrow, it would still take decades for it to disappear from our food and water supply. More than twenty years of spraying means it's in the topsoil of much of the world's farmlands.[114]

Some of the feed and by-products these animals consume come from genetically modified organisms. But eating meats from feed-lot animals may provide a layer of protection, thanks to the animals' own aromatic amino acids. Table 5.5 provides examples of foods with all three aromatic amino acids.

This might be why carnivores that consume genetically modified grain-fed animals appear to have better health than the average American. In fact, according to a review article in *Interdisciplinary Toxicology*, "Deficiencies in tryptophan, tyrosine, methionine, and selenomethionine associated with celiac disease match glyphosate's known depletion of these amino acids. Celiac disease patients have an increased risk to non-Hodgkin's lymphoma." Glyphosate exposure can also cause deficiencies in vitamin D, manganese, magnesium, boron, and omega-3.[115]

Where Glyphosate Is Used

If you think that eating only organic plants will save you from glyphosate exposure, that's not entirely true. While it's true that Roundup won't have been sprayed directly on organic crops, most plant foods, organic and nonorganic, are grown in the same area of the United States (see Figure 5.6). Glyphosate runoff is very real.

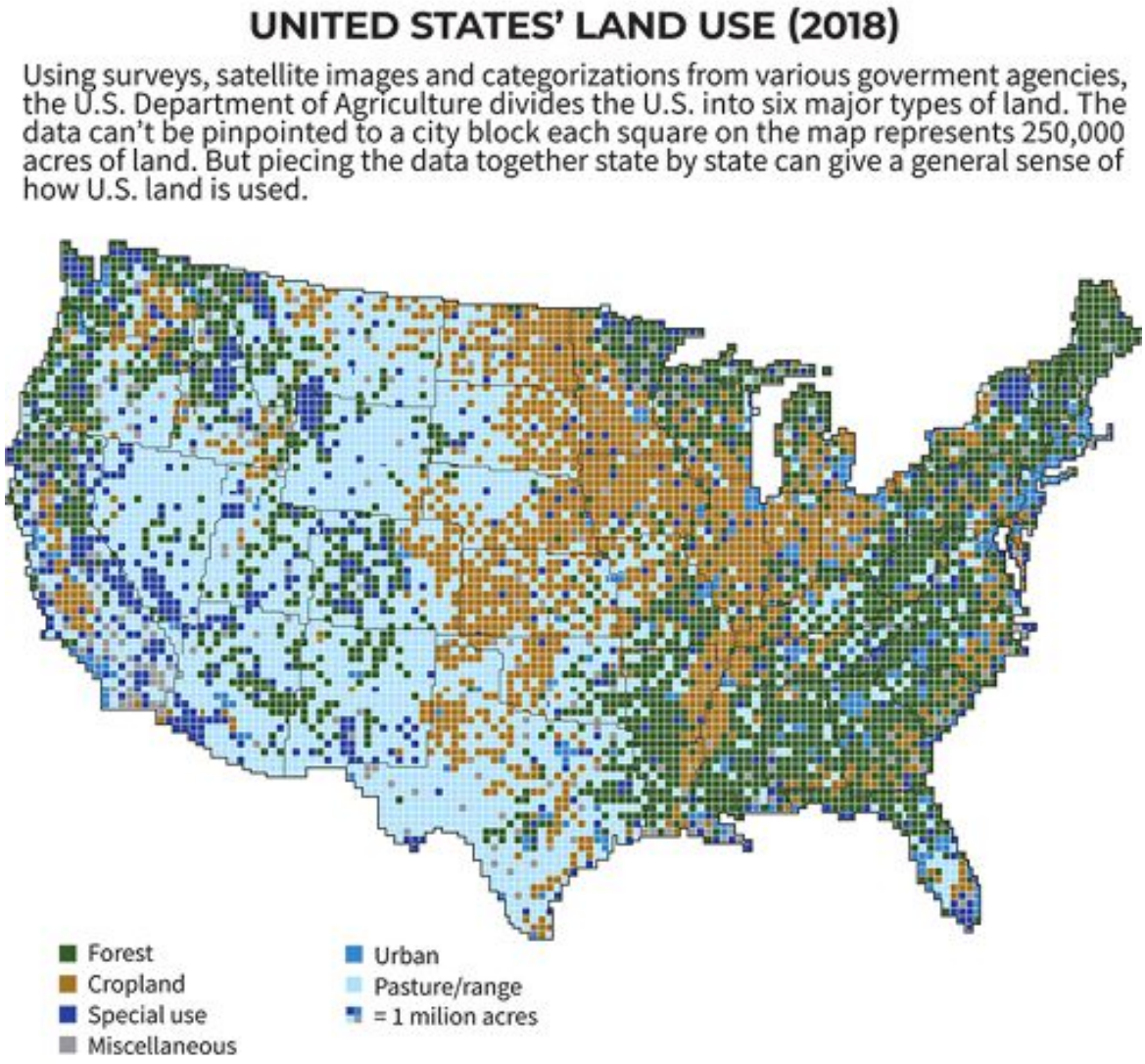

Figure 5.6. U.S. Department of Agriculture's Economic Research Service Report, "Major Use of Land in the United States," (2017).

If there's an argument for grass-finished animals, it's this: pasture range (grass-fed animals) are typically not near croplands. Less cropland means less glyphosate exposure.

Figures 5.7 shows the increase in U.S. glyphosate usage in just fifteen years. Figures 5.8 and 5.9 show U.S. land use and the use of pesticides and glyphosates.

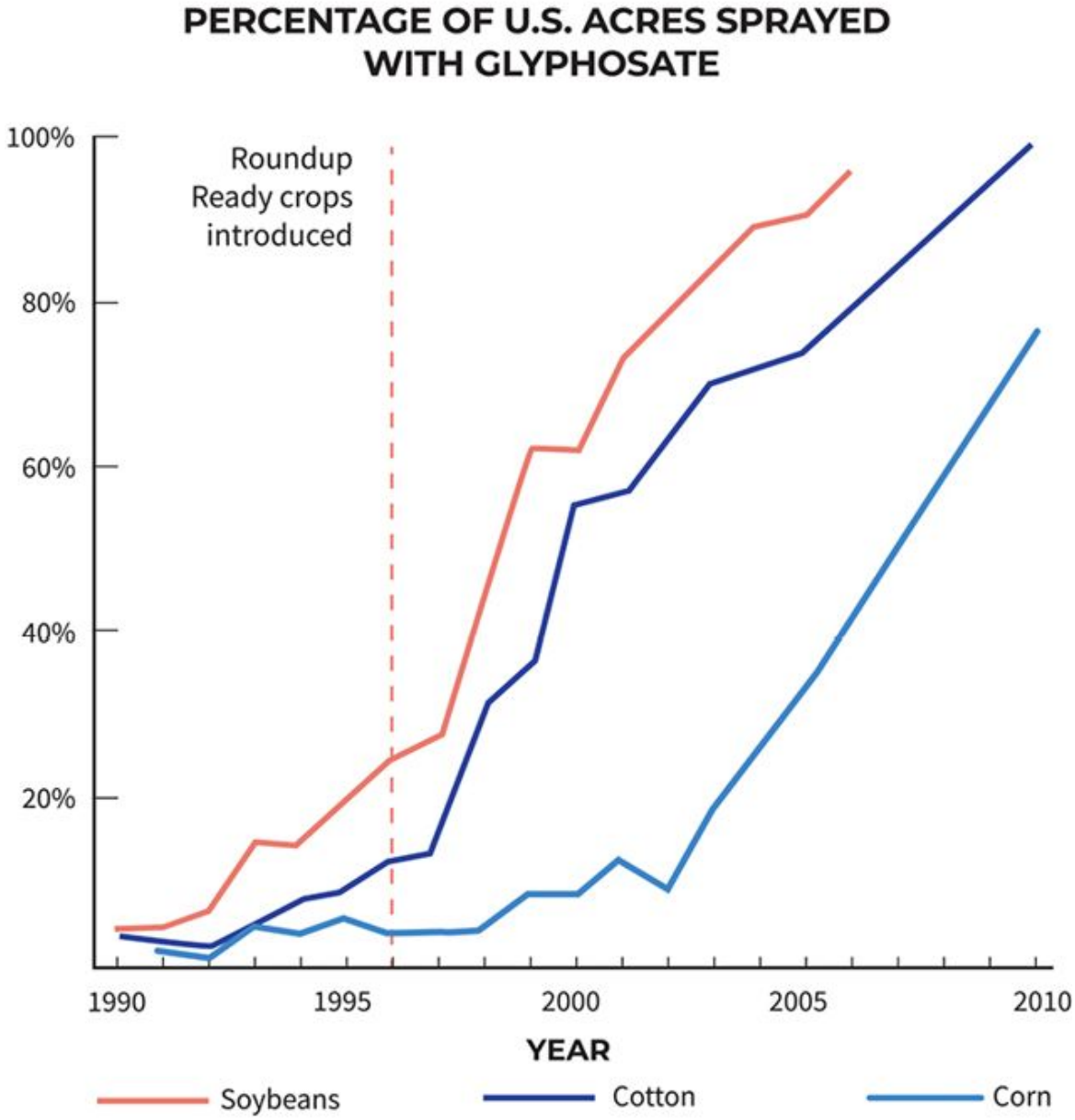

Figure 5.7. Chow, Lorraine, "Monsanto's Glyphosate Most Heavily Used Weed Killer in History," *EcoWatch*, (2016).

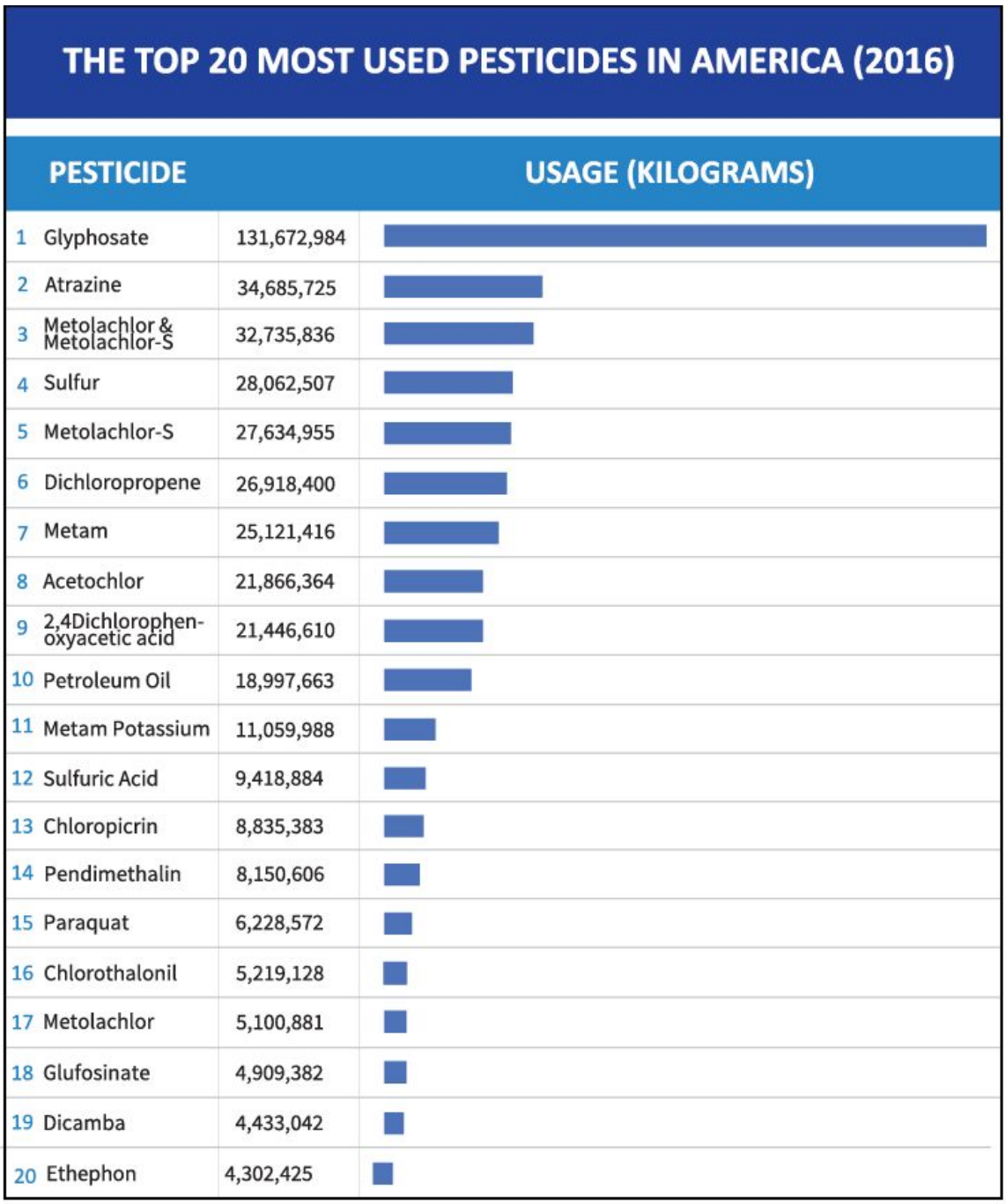

Figure 5.8. Weed Killer Crisis, "Pesticides in America," weedkillercrisis.com, (2019).

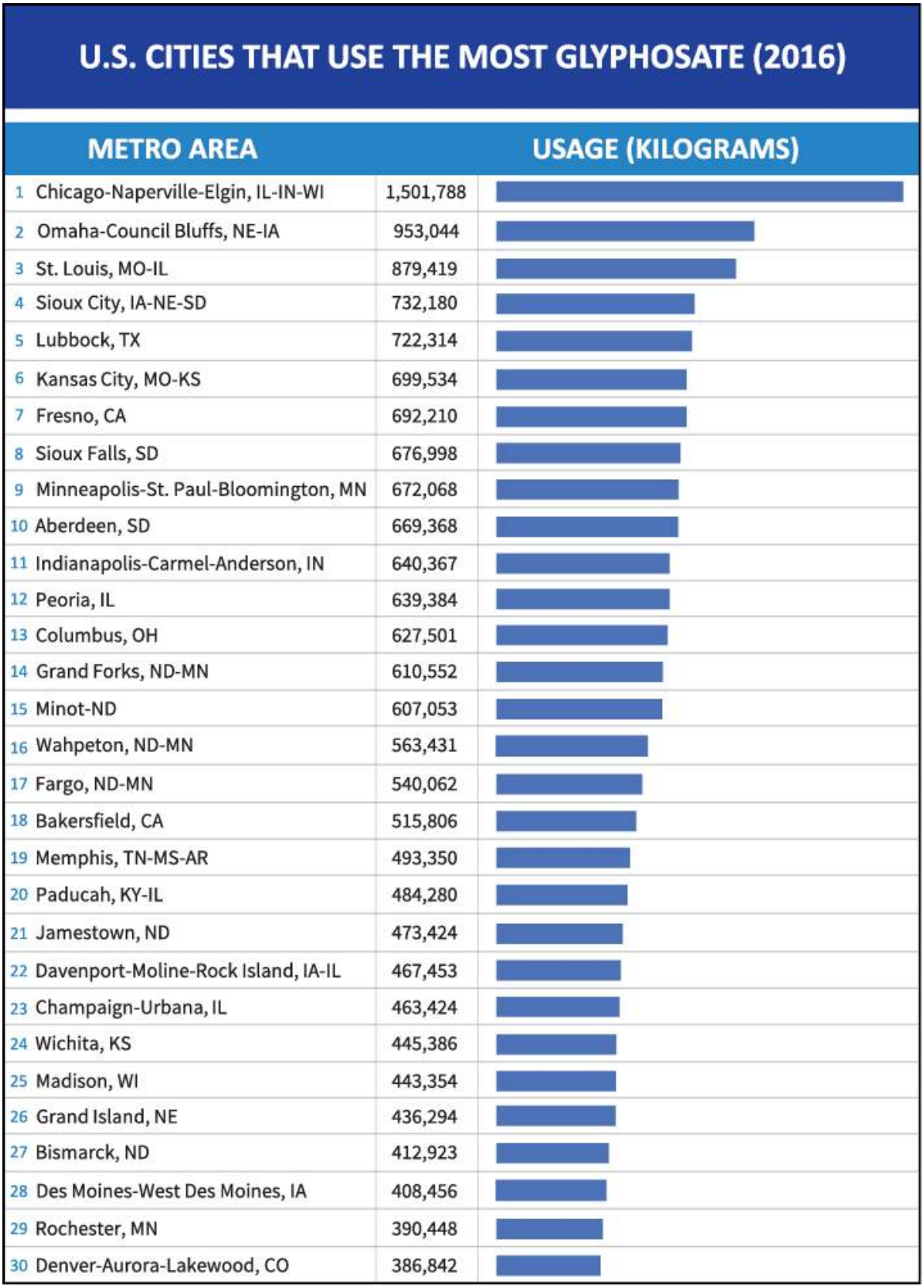

Figure 5.9. Weed Killer Crisis, "Pesticides in America," weedkillercrisis.com, (2019).

Glyphosate and an Increase in Disease: Coincidence?

The obesity rate has *doubled* in less than one generation when humans have been around for a very long time. What caused obesity rates to double in just 20 years?

Since the introduction of genetically modified foods in 1996, we now have an unprecedented rise in autism, food allergies, diabetes, digestive disorders, obesity, and reproductive issues. Figure 5.10 depicts glyphosate's use growth curve, and Figure 5.11 shows the increase in children with autism alongside glyphosate use on corn and soy crops.[116]

You will find some figures below that show strong correlations with the use of Glyphosate-ready Roundup and various illnesses, from obesity rates doubling in twenty years to increases in autism. Sure, some may argue that correlation and high statistical significance doesn't mean causation. Maybe there is a lurking 3rd variable. Maybe.

This lines up with the statistics of Childhood in America. Dr. Stephanie Seneff, a senior research scientist at the Computer Science and the Artificial Intelligence Laboratory of the Massachusetts Institute of Technology, prepared the following statistics about children for presentation during a U.S. congressional hearing on the safety of glyphosate on June 14, 2016.

- 1 in 3 is overweight
- 1 in 6 has learning disabilities
- 1 in 9 has asthma
- 1 in 10 has ADHD
- 1 in 12 has food allergies
- 1 in 20 has seizures

- 1 in 54 males has autism
- 1 in 68 has autism
- 50% of all children have a chronic illness or are overweight.[117]

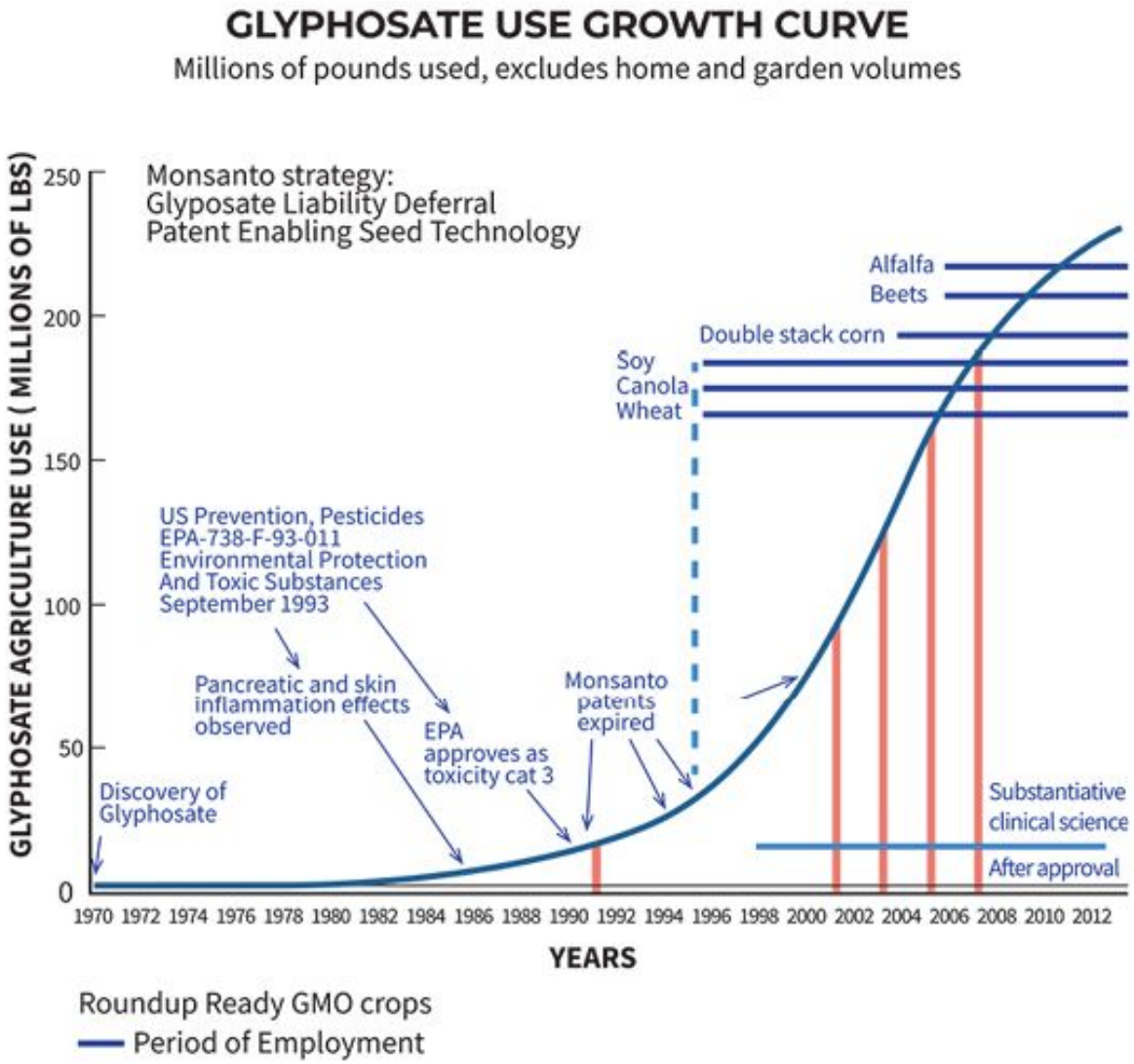

Figure 5.10. Seneff, Stephanie, "Glyphosate Correlations with Disease," U.S. Congressional Hearing on Glyphosate Safety, (2016).

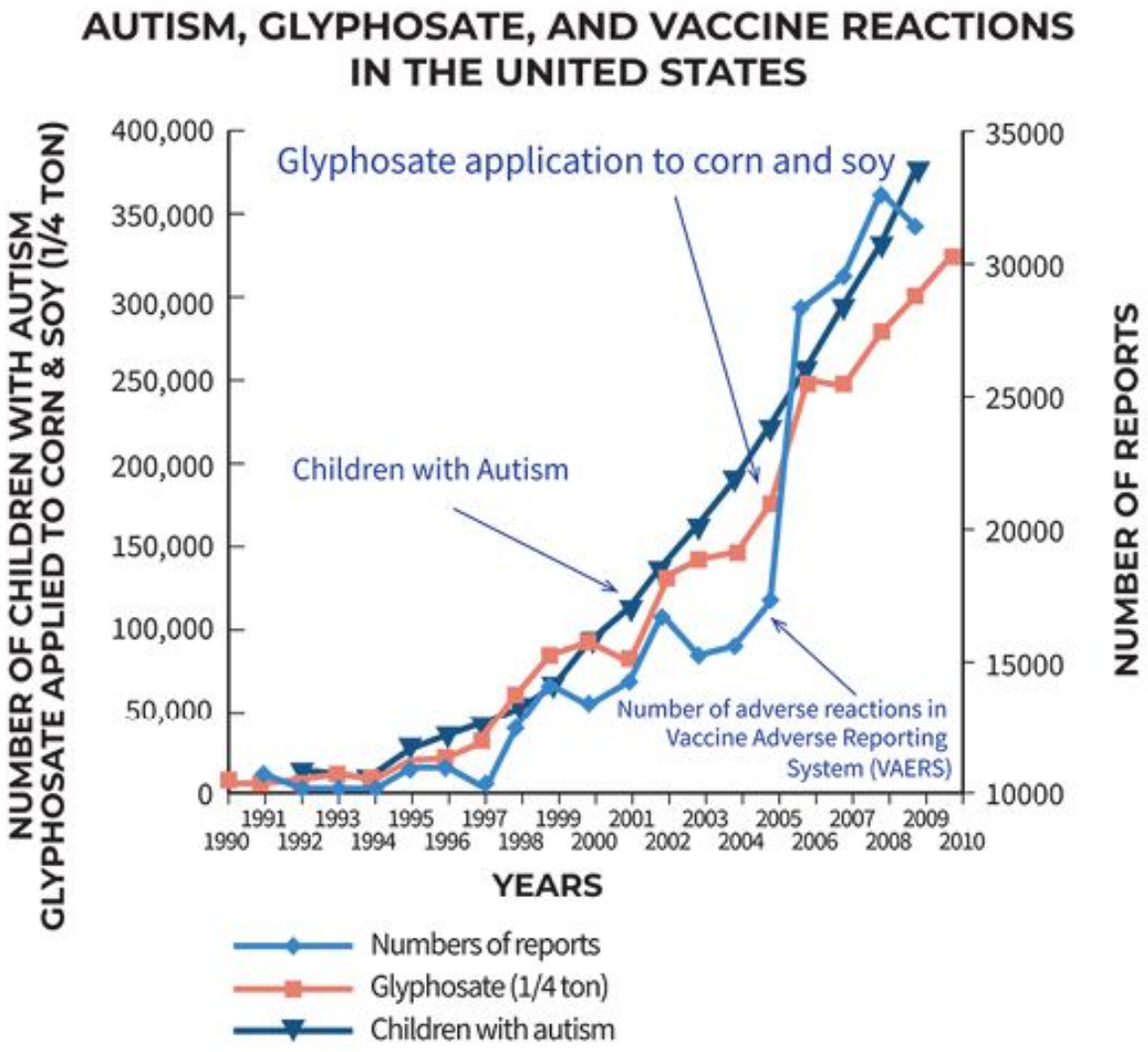

Figure 5.11. Ibid Figure 5.10.

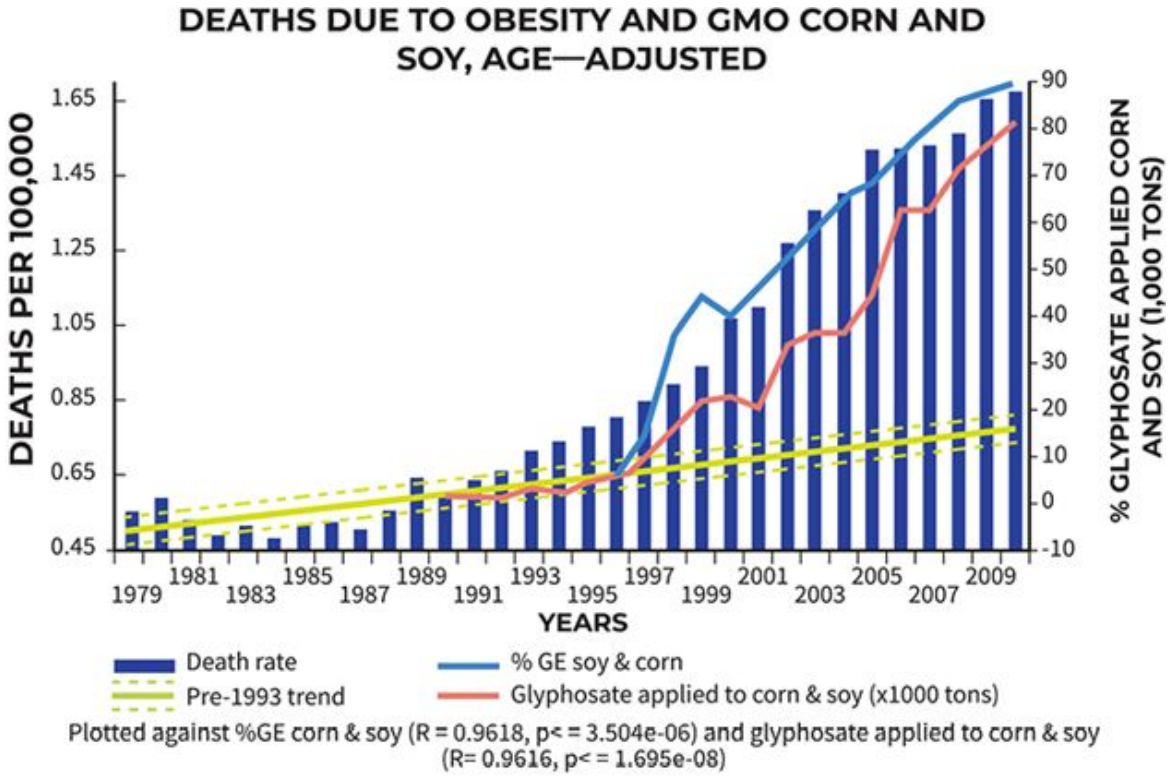

Figure 5.12. Ibid Figure 5.10.

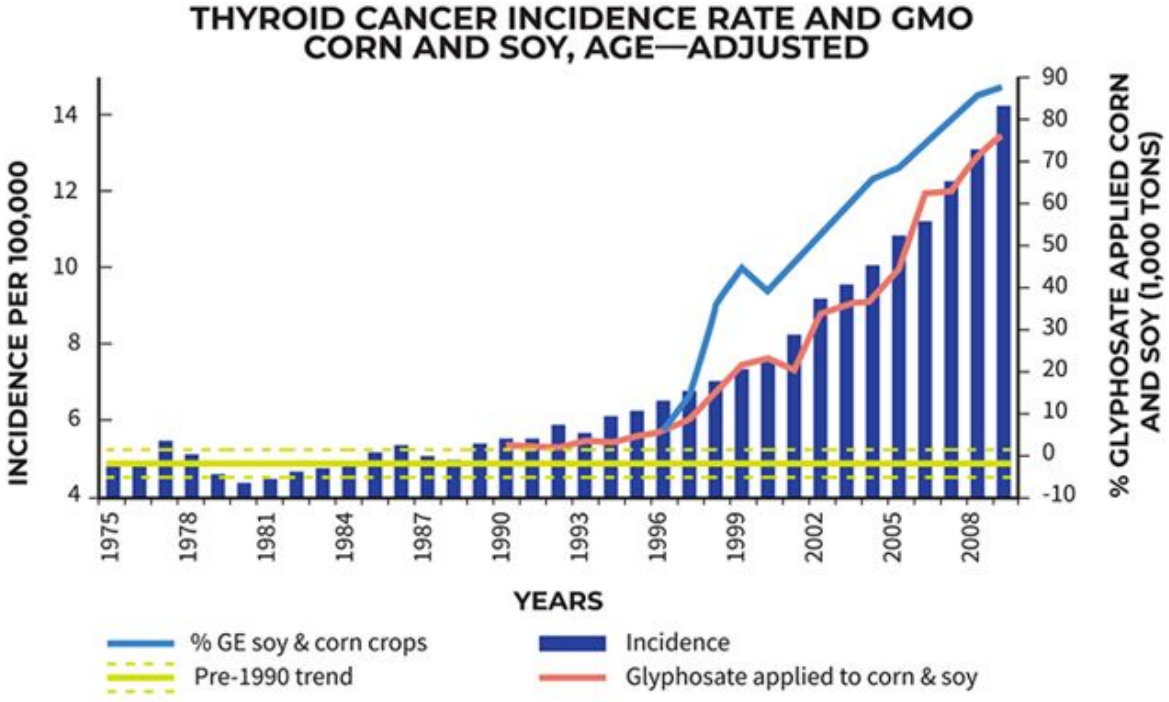

Figure 5.13. Ibid Figure 5.10.

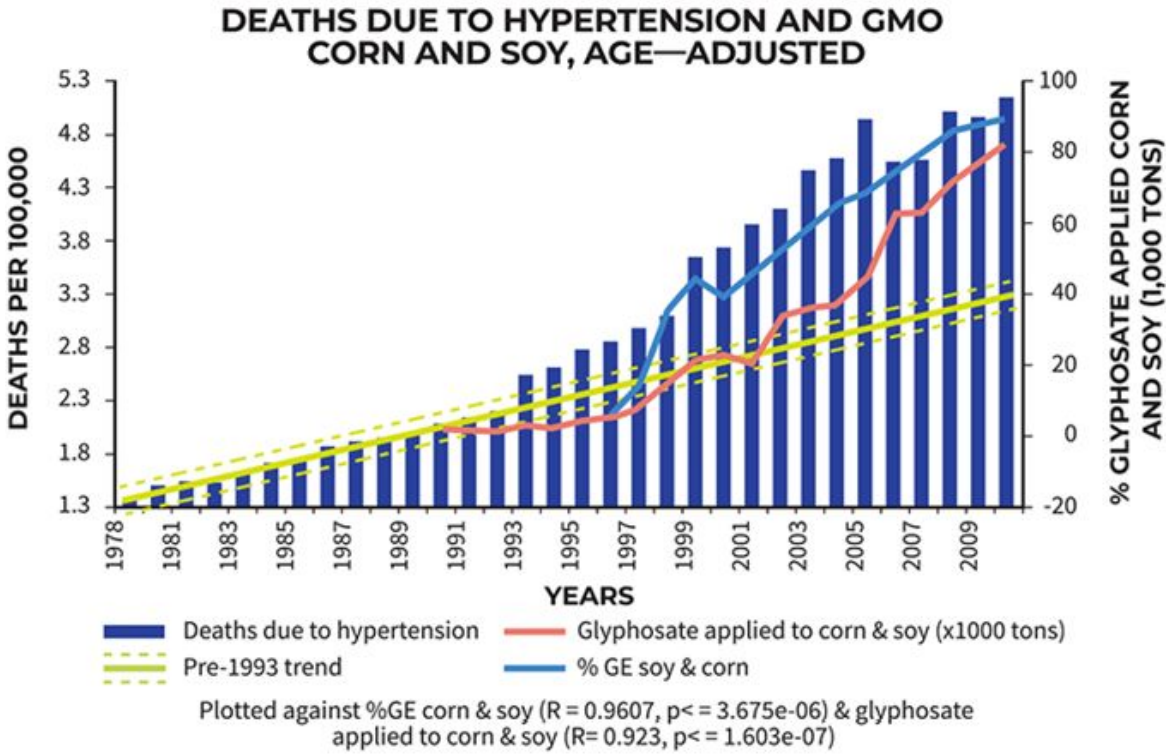

Figure 5.14. Ibid Figure 5.10

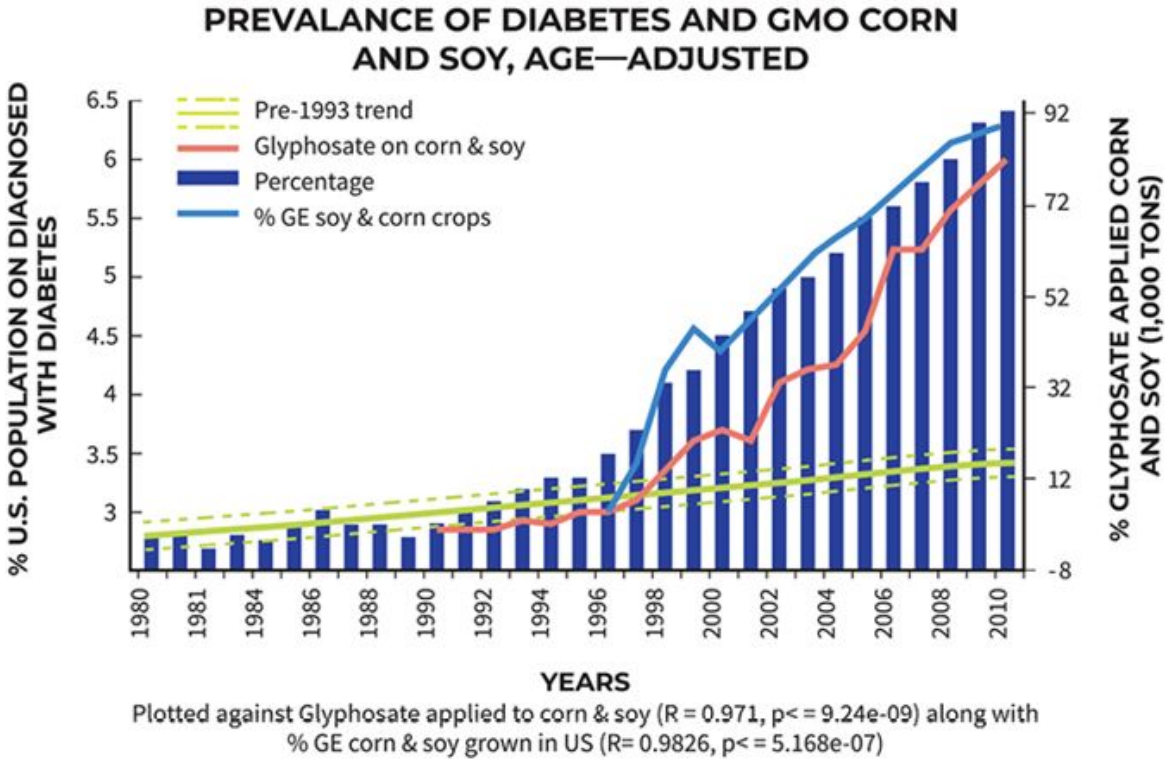

Figure 5.15. Ibid Figure 5.10.

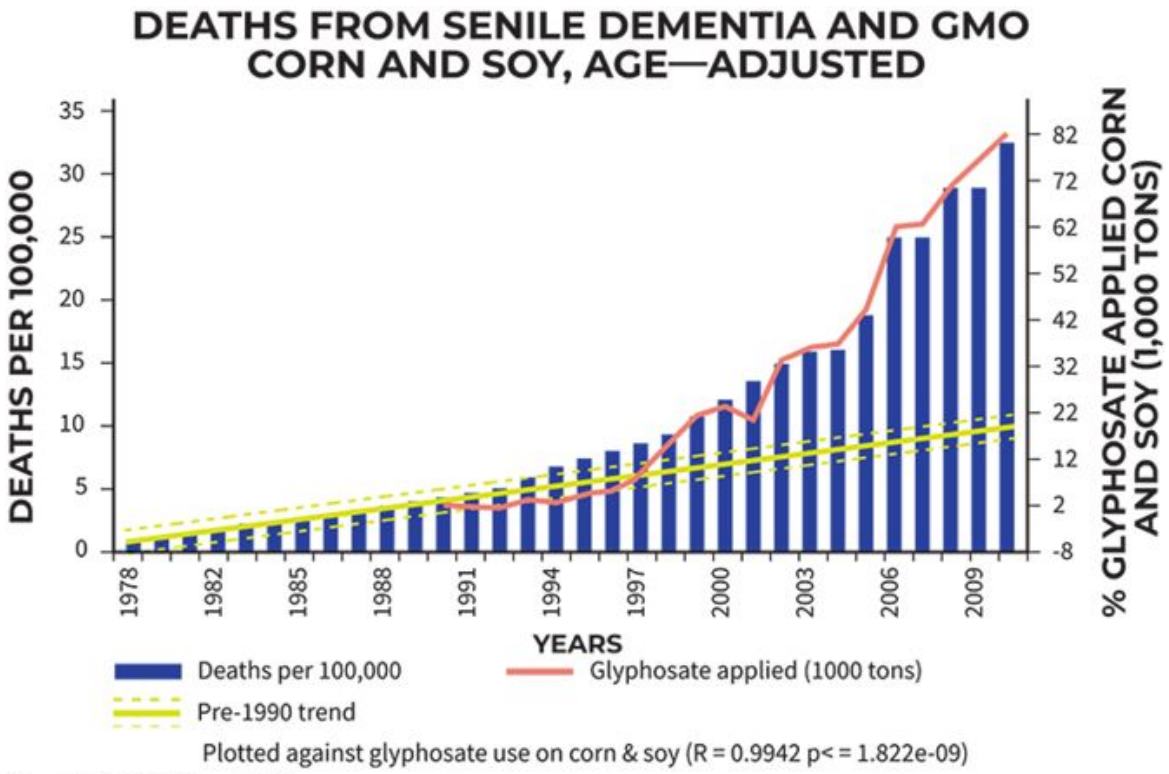

Figure 5.16. Ibid Figure 5.10.

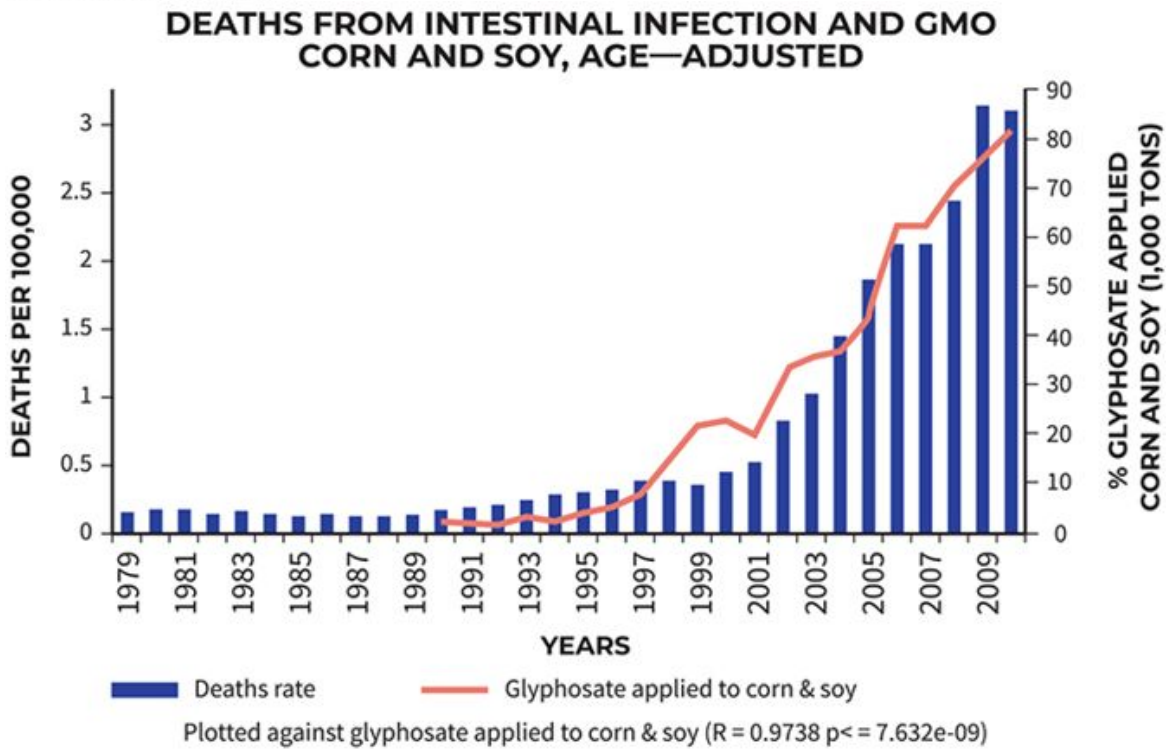

Figure 5.17. Ibid Figure 5.10.

Monsanto, Bayer, and Germany

In September 2016, Bayer announced its decision to acquire Monsanto, the massive seeds and pesticide company, for $66 billion. On June 7, 2018, Bayer completed the purchase. Bayer is a German pharmaceutical company and one of the largest in the world. Bayer's claim to fame was aspirin. The Bayer-Monsanto acquisition was the single largest all-cash bid on record. This deal made Bayer responsible for 25 percent of the world market for seeds and pesticides.

Other companies have also formed similar mergers recently: Dow Chemical and DuPont became DowDuPont in August 2017 (although they are splitting into three separate companies). ChemChina acquired a Swiss seed and pesticide company, Syngenta, in February 2016.

DuPont is a biotechnology company that manufactures pharmaceuticals, chemicals, and petroleum-based fuels. Dow AgroSciences is responsible for insecticides like Lorsban, herbicides, and fungicides. Dow's genetically modified seeds are sold under the brands Mycogen (corn, sunflowers, alfalfa, and sorghum), Atlas (soybean), PhytoGen (cotton), and Hyland Seeds in Canada (corn, soybean, alfalfa, navy beans, and wheat).

No one knows what all these agricultural business mergers will mean for farmers, our food products, and society as a whole. Many farmers have taken a wait-and-see approach, but the mere fact that pharmaceutical companies are buying up companies that sell crop seeds and herbicides, fungicides, and pesticides is worrisome.

One country decided not to take the wait-and-see approach. Bayer, which became Monsanto's parent in June 2018, is headquartered in Germany. Only a little more than a year after Bayer bought Monsanto in September 2019, Germany—Bayer's home country—

announced the complete ban of glyphosate by 2023. Monsanto will be sold and used everywhere in the world, except its home country.

FDA APPROVED GENETICALLY MODIFIED CROPS

As of 2012, there are a total of 144 GMO crops approved by the FDA. Of the 144 crops approved, 75 percent have been genetically engineered to either withstand direct applications of herbicides or they contain an insecticide toxin, or both. In the 1990s, scientists figured out how to combine more than one trait in the same plant, called stacked gene traits, and were released in 1997.

GE CROP	# OF FDA APPROVALS	FDA PRODUCT		OTHER USES
Alfalfa	1	• Seeds • Sprouts	• Leaf meal used for fortifying baby food	• Animal feed
Canola (rapeseed)	17	• Cooking oil • Mayonnaise	• Salad dressing	• Animal feed
Cantaloupe	1	• Cantaloupe		
Corn (maize)	38	• Cooking oil • Corn	• Corn products • Corn syrup	• Animal feed
Cotton	22	• Cottonseed oil for fried foods		• Animal feed • Cloth
Flax	1	• Meal added to grain products	• Oil as a supplement	• Animal feed • Cloth
Papaya	2	• Juice	• Papaya	
Plum	1	• Canned plums • Jam	• Jelly • Plum	
Potato	28	• Flour • Potato	• Potato chips	• Animal feed
Radicchio	1	• Radicchio		
Rice	2	• Crackers • Cereal	• Flour • Rice	• Animal feed
Soybean	17	• Cooking oil • Cereal products • Flour • Infant formula • Lecithin • Mayonnaise	• Salad dressing • Soy milk • Soy nuts • Soy protein • Soy sauce • Tofu	• Animal feed
Squash	2	• Squash		
Sugar beet	3	• Anything with beet sugar		• Animal feed
Tomato	7	• Canned tomato • Ketchup	• Tomato • Tomato Sauce	

Table 5.18. FDA Approved GMO Crops.

This may be reason enough to stop consuming any products (reference Table 5.18) containing genetically modified organisms.

Supporting the Body Against Glyphosate

So how do you support your body against glyphosate? Consume more foods rich in the aromatic amino acids phenylalanine, tyrosine, and tryptophan. Eat foods with significant sulfur content—such as eggs and organic raw cheese—because glyphosate depletes sulfur in the body. Sulfur also helps the body detoxify; insufficient levels of sulfate in the brain can impair the body's ability to remove harmful toxins and metals.

Because glyphosate acts as an antibiotic, you also need to support the gut microbiome by increasing your intake of probiotics.

Eat foods rich in manganese. Glyphosate is a chelator (binder) of minerals, binding with manganese and leaving plants, animals, and people depleted of this essential nutrient. Manganese is crucial to the proper working of several enzymes that process carbohydrates, amino acids, and cholesterol.

FOODS RICH IN TYROSINE, TRYPTOPHAN, AND PHENYLALANINE		
Tyrosine	• Avocado • Bananas • Buttermilk • Chicken • Eggs • Fish, white	• Milk • Parmesan cheese • Salmon • Turkey • Seaweed • Swiss cheese
Tryptophan	• Beef • Chicken • Dairy • Elk • Halibut • Lamb	• Pork • Salmon • Shellfish • Tuna • Turkey • Veal
Phenylalanine	• Beef • Chicken • Dairy • Eggs • Fish	• Lamb • Pork • Shellfish • Turkey • Veal

Table 5.19. Foods Rich in Tyrosine, Tryptophan, and Phenylalanine.

Glyphosate Bans

Countries and cities are slowly beginning to regulate, even ban, the toxin. According to *Sustainable Pulse*, a private news source focused on genetically modified organisms, sustainable food, and sustainable agriculture, twenty-two countries in addition to Germany have bans or restricted use of glyphosate: Austria, Bahrain, Belgium, Bermuda, Costa Rica, Czech Republic, Denmark, France, Italy, Kuwait, Malawi, Mexico, Netherlands, Oman, Saudi Arabia, Sri Lanka, Thailand, Togo, Qatar, St. Vincent and the Grenadines, United Arab Emirates, and Vietnam.[118]

In 2015 the World Health Organization's cancer group classified glyphosate as a probable carcinogen. The State of California has classified glyphosate similarly.[119] Some cities have also banned the use of Roundup in public areas.[120]

Literature and research on glyphosate, and the harmful consequences of glyphosate and other pesticides, has exploded. The more you learn, the more you can protect yourself and your loved ones.

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Chapter 6

The Plant Kingdom

What is food to one man may be fierce poison to others.

—Lucretius

IF YOU EAT plant-based foods, organic is better than the genetically modified alternative. But organic doesn't always mean safer.

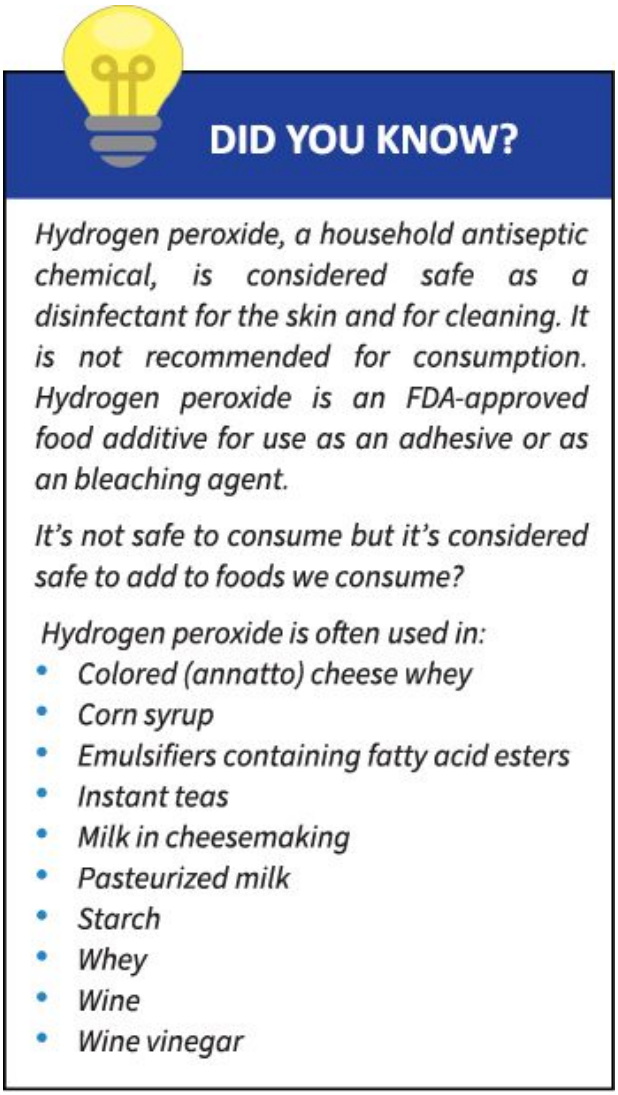
The World Health Organization warns that some plant foods contain natural toxins and advises that we minimize our health risk from these organic and natural toxins. One morsel of advice the World Health Organization recommends is to "not assume that if something is 'natural,' it is automatically safe." Seven out of the eight natural toxins discussed are from edible plants. Plants produce these natural toxins as a defense mechanism.[121]

Pesticides Used on Organic Plant-Based Foods

Organic plant-based foods often use pesticides, herbicides, and insecticides. The suffix *-cide* is derived from the Latin word for killer, and even if naturally derived, all pesticides, herbicides, and insecticides have toxins.

The U.S. Department of Agriculture's (USDA) guidelines for organic pesticide use is far more lenient than the rules for conventional pesticides. The Environmental Protection Agency (EPA) regulates synthetic pesticide use at the national level and works with state agencies, the U.S. Food and Drug Administration (FDA), and the Agriculture Department to regulate and frequently test levels of nonorganic and synthetic pesticides in plant-based foods.[122] The

FDA no longer regulates organic foods; instead, these are overseen by a federal regulatory program called the National Organic Program, established by Congress in 1990. Through a public-private partnership, this program accredits third-party companies to certify farms and food companies that "meet the national organic standards."[123]



While some private third-party certifiers, such as the nonprofit Oregon Tilth, Inc., have stringent policies and standards for certifying organic, not all third-party companies are equally exacting. The USDA's use of third-party certifiers has allowed agribusiness to dominate the $50 billion organic market[124] Figure 6.1 depicts some

of the alliances of third-party organic certifiers, organic trade association lobbyists, and large organic corporations.

Forty-seven of the 78 USDA-accredited certifying companies are based in the United States. The other thirty-one companies are located in other countries because most organic foods purchased by Americans are imported. Since 2015, when the National Organic Program began its organic integrity database, which lists all organically certified farms and food companies, 138 companies have been charged with operating under fraudulent organic certificates. In 2020, of the 61,202 organic certifications listed, 13,138 have been surrendered, 3,463 have been suspended, and 94 have been revoked. In less than 5 years, 27 percent of organic certification have been nullified in some way.[125]

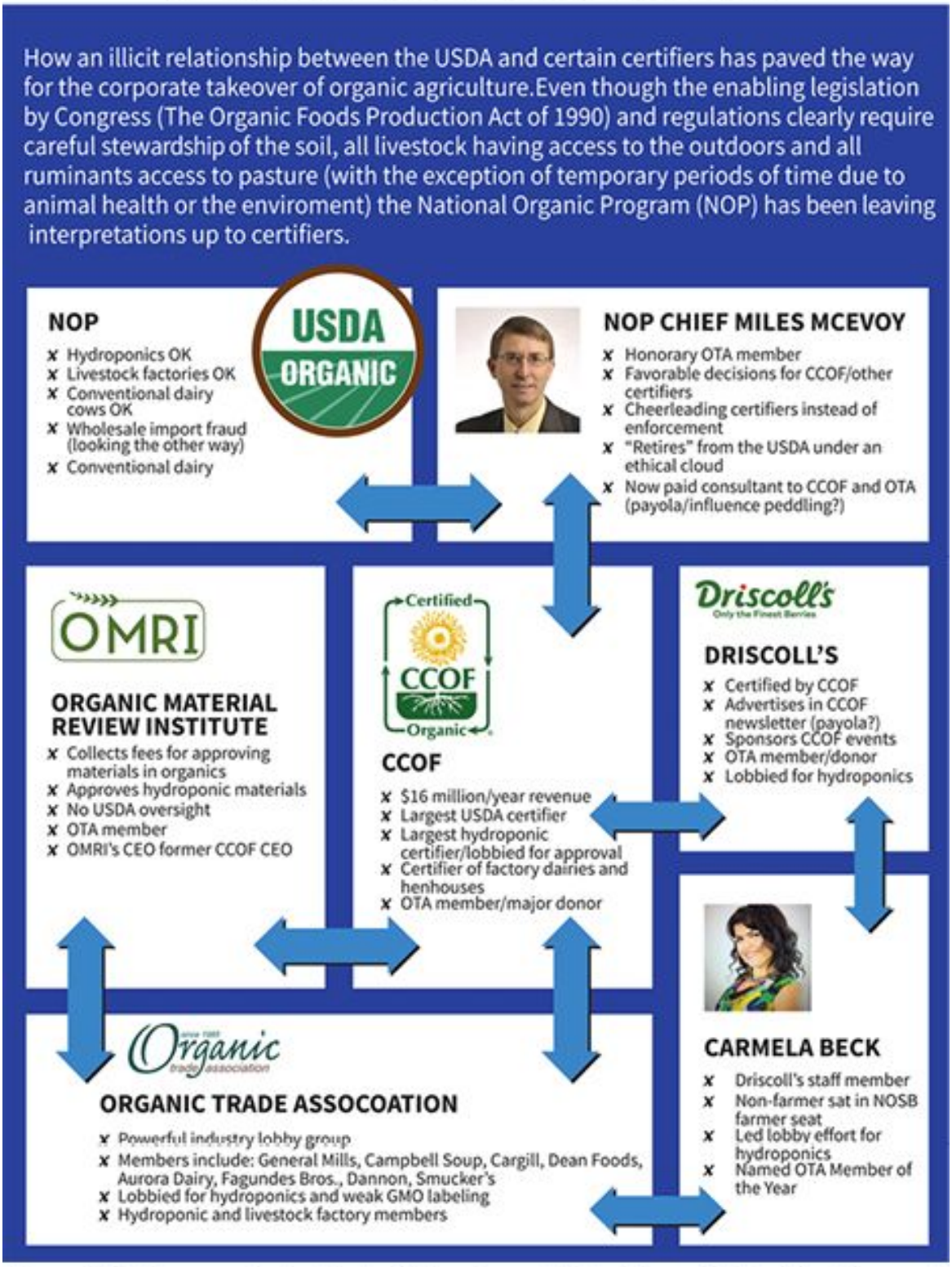


Figure 6.1. Cornucopia Institute, "New Report Puts Farmer's Back in Charge of Organic Certification," (2019).

Limited Testing of Organic Produce

The lack of stringent organic regulations and limited testing of organic produce are the main criticisms of the U.S. organic labeling system. In 2015, the USDA's Pesticide Data Program, which annually tests food samples for pesticide levels, tested 10,187 samples, but only 360—3.5 percent—were samples of foods labeled organic. Although the program's report for that year ran 193 pages and noted that some samples violated tolerance levels and others showed pesticide residues, nothing discussed the test results from the 360 organic samples.[126]

Organic pesticides may include heavy metals, including types of copper and iron. According to a 2001 USDA report, copper sulfates can have adverse effects on soil microorganisms and be harmful to humans and animals, not only from the application but from residuals in food. In fact, copper can be toxic to chickens and sheep at permitted application rates. Even if copper residue is washed off these edible plants, the runoff can be a pollutant. Copper can persist in water indefinitely."[127]

The USDA Pesticide Data Program tested organic lettuce once in 2009. The report found that 20 percent of organic lettuce tested positive for organic and synthetic pesticide residues. Some samples exceeded the tolerance levels for these pesticides and insecticides. One of the organic pesticides that was found in excess was spinosad.[128] The testing found ten times as much spinosad on organic lettuce as on conventional fruits and vegetables, to which it is also applied. Spinosad is certified for organic produce but works so well that a synthetic version is now available.[129]

The 2015 USDA Pesticide Data Program report found that 157 of 213 sample nectarines from Chile—almost 74 percent— had

detectable levels of spinosad residue. In the United States, 64 of the 364 samples were found to have detectable levels of spinosad residue.[130]

Dosage Matters

Spinosad, azadirachtin, and pyrethrin are three organic pesticides that the Environmental Protection Agency has classified as slightly toxic, even at permitted levels. According to Jeff Gillman, a professor of nursery management at the University of Minnesota, the amount of organic pesticide used is a primary determinant of whether an organic pesticide is safer than synthetic pesticides.[131]

APPROVED ORGANIC PEST AND PLANT CONTROL TOXINS

The following are the most used organic pest control toxins used in California (2015).

	PEST CONTROL	POUNDS	ACRES	LBS./ ACRE
1	Sulfur	50,296,294	5,658,054	8.89
2	Mineral Oil	25,168,737	2,360,249	10.66
3	Petroleum Oil	12,779,418	821,933	15.55
4	Kaolin	3,521,976	101,445	34.72
5	Copper Hydroxide	2,310,199	1,244,102	1.86
6	Petroleum Distillates	2,021,199	289,463	6.98
7	Copper Sulfate Pentahydrate	1,678,972	106,685	15.74
8	Lime Sulfur	1,409,920	61,406	22.96
9	Copper Sulfate Basic	1,326,680	400,873	3.31
10	Paraffin Based Oils	1,127,920	652,826	1.73
11	Copper Oxychloride	396,379	289,840	1.37
12	Copper Oxide	357,410	126,760	2.82
13	CHE of Neem Oil	222,741	88,172	2.53
14	Spinosad	37,796	378,854	0.10

APPROVED SYNTHETIC PEST AND PLANT CONTROL TOXINS

The following are the most used nonorganic pest controls toxins used in California (2015).

	PEST CONTROL	POUNDS	ACRES	LBS./ ACRE
1	Glyphosate, Potassium	6,496,955	3,416,955	1.90
2	Glyphosate, Isopropylamine	4,814,087	2,176,738	2.21
3	Pendimethalin	2,352,571	1,068,379	2.20
4	Paraquat Dichloride	1,226,372	1,251,372	0.98
5	Oxyfluorfen	882,070	2,174,194	0.41
6	Ammonium Sulfate	760,184	2,229,786	0.33
7	Imidacloprid	441,304	1,627,772	0.27
8	Bifenthrin	372,290	1,419,728	0.26
9	Methoxyfenozide	356,617	1,436,057	0.25
10	Boscalid	209,461	862,173	0.24
11	Azoxystrobin	174,702	1,007,106	0.17
12	Pyraclostrobin	148,147	1,217,158	0.12
13	Spirotetramat	99,512	925,092	0.11
14	Spinetoram	77,139	1,196,821	0.06

Sometimes organic and nonorganic products are nearly identical. For example, the main organic insecticide, Spinosad, is widely used by conventional farmers. Dow sells the organic version under the Entrust label and the conventional version (different adjuvants) is sold under the name Success. Spinetoram, a synthetic derivative chemical, is sold as Radiant.

Table 6.2. California Use Rates, (2015).

Table 6.2 portrays the use of organic and synthetic pest and plant control toxins in California. California has more organic operations than any other state. In 2015 alone, California used eight pounds more of organic pest and plant control toxins per acre than the synthetic kind.

According to the April 2018 USDA National Organic Program report, no one has been mining sulfur from limestone or volcanic rock since the late twentieth century. The sulfur used in organic farming today is a nonorganic byproduct of other industrial processes, such as oil refining. The same report explains how sulfur kills fungi on contact

and kills insects that touch or eat the pesticide. Sulfur may disrupt an insect's normal body functioning and the production of energy, or it may react with the plant to produce a toxic agent. What's concerning is that the report notes, "the way sulfur works is not completely understood." Organic agriculture in one state uses 50.3 million pounds of nonorganic sulfur from oil refining in one year, and not knowing exactly how sulfur works as a pesticide is concerning.[132]

Rotenone. One common organic insecticide and pesticide is rotenone. Rotenone is extracted from the roots and stems of tropical plants, such as the jicama vine plant, and is considered safe. But rotenone has been found to attack the mitochondria of all living cells. It is also toxic to bees, and a small amount of rotenone can kill all the fish in a pond. It is used for foods like arrowroot, but residue on foods can hasten Parkinson's disease.[133]

Rotenone was banned in 2005 because of health concerns. All toxins are studied to determine their acute toxicity, defined by a dose that would kill at least 50 percent of the sample rodent population. This acute toxicity is referred to as the Lethal Dose 50 (LD50): the lower the LD50, the more toxic the toxin. Anything less than an LD50 of 500 mg/g is considered a dangerous poison, and an LD50 of 1000-2000 mg/g a caution poison. Rotenone has an LD50 of 132-500 mg/g, making rotenone a dangerous poison.

Since LD50 measures the risk when exposed to a large amount of toxins in a short amount of time, it should never be the only factor for measuring safety. As an example, one study found that dogs fed rotenone for six months at low doses were frequently found to have bleeding patches in the small intestine. When humans frequently consume organic-plant foods with rotenone residue, I wonder what effect it has on our small intestine.[134]

Although rotenone was banned in 2005, it was reinstated for organic pesticide use five years later. Rotenone is also commonly used in fishing and in powdered form to rid humans of head lice. Remember, anything on the skin bypasses the gut and is absorbed directly into the bloodstream. Organic or not, having rotenone directly absorbed on the scalp is not a good thing. Table 6.3 provides other commonly used organic pest and plant control toxins.

ORGANIC PEST AND PLANT CONTROL TOXINS

Due to widespread use of pesticides, fungicides. insecticides and herbicides, we are now exposed to low levels of these chemicals in our diets.

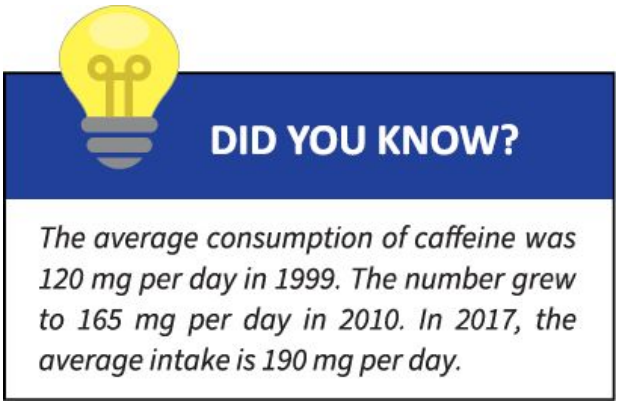
USE AND RISKS OF ORGANIC TOXINS	
Azadirachtin (Neem oil)	• Used as a pesticide in organic farming, especially with apples. • May cause allergic reactions, may reduce fertility and cause miscarriage and may cause kidney damage.
Boron	• Used as an organic fertilizer and can enter the body when consuming fruits and vegetables, drinking Boron-contaminated water, breathing Borate dust in the air, and Boron's contact with skin. Boron can stay in the body for up to four days. • Found in plant foods, pesticides, detergent, facial creams and household products. • Chronic exposure at high levels can effect the brain, heart and liver.
Copper sulphate	• Used as an organic fungicide. The copper binds to proteins in fungi and algae, and considered more toxic than synthetic alternatives. • Copper sulphate has synthetic options because it's so effective. • Studies show it's toxic to humans, animals, bees and the environment. • Vineyard sprayers experienced liver disease after 3 to 15 years of exposure to copper sulfate solution in Bordeaux mixture. • Injury to the brain, liver, kidneys, and stomach and intestinal linings may occur in copper sulfate poisoning. Copper sulfate can be corrosive to the skin and eyes. • The European Union recommends minimal use of copper sulphate.
Lime sulphur	• Very toxic to earthworms that play a significant role in soil regeneration. • "May be fatal if swallowed, inhaled or absorbed through skin… corrosive to flesh and causes irreversible eye damage and skin burns. Do not breath dust, vapor or spray mist or get in eyes, on skin or on clothing." (EPA, 2002) I'm sure farmers that use Lime Sulphur won't get it on their skin or clothing. • In the United States, lime sulfur has been rated a danger.
Nicotine sulphate	• Nicotine is natural and used as an organic pesticide to control insects. • For most living species, consuming small quantities of nicotine is deadly. • Considered a neurotoxin that interferes with communication between the muscles and nerves. Gardeners have shown increased blood pressure, irregular heartbeats, and some gardeners have even died from exposure to nicotine sulphate. • In the United States, nicotine sulphate has been rated a danger.
Methyl bromide	• Used on plants, spiders, rodents, and to extract oils from nuts, seeds, and flowers. • Shown to destruct the ozone layer and so potent that farmers are strongly advised to get professional sprayers. It is a toxic inhalant and can cause widespread tissue and organ damage. • May damage the brain, kidneys, heart, adrenal glands, and other vital organs.
Pyrethrin	• Natural insecticide for ants, fleas, mosquitos and moths. • Extracted from flowers, pyrethrin has synthetic options because it's so effective. • The dangers of pyrethrin are many, including respiratory, immunological, neurological effects.. It can cause tingling or numbness at site of contact. • Low dose, chronic exposure can cause allergic and respiratory disease.

Table 6.3. Organic Pest and Plant Control Toxins.

Caffeine and Coffee

Roasted coffee beans come from the seeds in the Coffea plant's berries. Coffee berries are picked after they ripen and then dried and processed. The dried coffee seed is roasted to make the coffee that 80 percent of Americans drink—90 percent of adults, and 85 percent of children consume caffeine daily. One reason people love coffee is that it contains the natural stimulant, caffeine. Coffea is but one of more than sixty plant species that contain natural caffeine in varying strengths. No, not all those children are drinking coffee, but have you seen children drinking Sunkist soda? It has more caffeine than most sodas. Forty-one milligrams, to be exact, about the same amount as half a cup of coffee. What about chocolate, frozen yogurt, ice cream, pudding, breakfast cereals, and headache medicines? Many contain caffeine.[135]

Caffeine has some benefits. It can provide you with more energy, focus, and mitigate the worst effects of an alcohol hangover. Coffee also acts as a diuretic and may suppress appetite. It can also increase the body's basal metabolic rate, meaning it'll help the body burn fat.



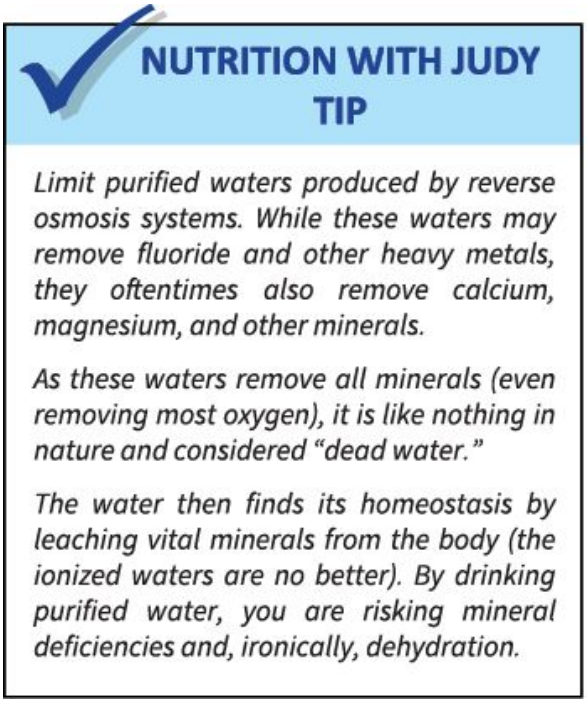
But caffeine can also cause acute anxiety and panic attacks. People who fast intermittently can sometimes experience muscle aches from caffeine withdrawal—not because of an electrolyte imbalance. Some

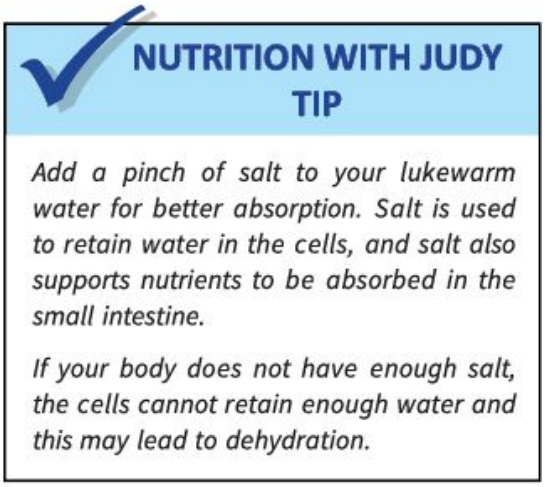
people who give up coffee believe that taking taurine supplements helps counter the effects of caffeine withdrawal. They could be right—taurine can mitigate anxiety and even support brain function.

The *DSM-5* of Mental Disorders includes caffeine withdrawal with withdrawal from other drugs, such as opiates and heroin. Human studies show that caffeine produces some reinforcing effects that are similar to those of amphetamines and cocaine. Caffeine also wakes up the adrenals to produce more cortisol.[136]

When you drink diuretics like coffee instead of water, you also run the risk of becoming dehydrated. The general rule of hydration is to drink half your body weight in fluid ounces. Additionally, if you drink a diuretic, you should also drink the equivalent amount in water.

The body needs water to function properly. The body is more than 60 percent water—the brain and heart are 73 percent water and the lungs about 83 percent water. Drinking coffee and other beverages that have a diuretic effect can alter the body's fluid balance. Caffeine also depletes magnesium, so make sure you eat magnesium-rich foods daily if you're a regular coffee or caffeine drinker.[137]





Because of the way coffee is grown, it can be a harborer of mold. If you have mold sensitivities, reducing coffee may help. Some studies show that the amount of caffeine in a cup of coffee reduces blood flow to the brain by 22 to 30 percent. Caffeine (tannin and flavonoids antinutrients in coffee) can also interfere with the absorption of vitamins and minerals (stop drinking coffee or caffeinated drinks with meals). One study found that "a mean dose of 250 mg of caffeine [a cup has 95 mg] produced approximately a 30 percent decrease in whole-brain [cerebral blood flow]. . . . Caffeine reduced CBF by an average of 27 percent across both caffeine states."[138]

Caffeine can exacerbate anxiety and sleeplessness. This is why anxious people are advised to avoid caffeinated drinks. Some people are more susceptible than others, but too much caffeine can make almost anyone anxious.[139] Maybe doctors should insist their patients struggling with anxiety give up caffeine before handing out a prescription for anti-anxiety medications.

In fact, Stephen Cherniske, a nutritional biochemist, writes in *Caffeine Blues* that he has found that a psychological evaluation often lists “one or more anxiety syndromes and the recommendation was for counseling. I would point out that the person was consuming excessive amounts of caffeine and requested a trial month off caffeine prior to therapy sessions. In about 50 percent of cases, the anxiety syndrome would resolve with caffeine withdrawal alone.”[140]

Studies have found associations between caffeine intake and increased stress, anxiety, and depression in schoolchildren. Researchers have also found that people susceptible to panic disorders are more likely to have anxiety induced by caffeine than those who did not consume caffeine. People who consume large amounts of caffeine may suffer hallucinations, usually preceded by panic attacks (genetics may play a role).[141]

One study gave participants 300 mg of coffee (about three cups) in the morning and no other caffeine for the rest of the day. The study subjects still experienced some disruption of sleep at night. Caffeine can exacerbate sleep issues for people who are sleepless because of stress. Caffeine decreases stage 3 and stage 4 sleep, which is 20 percent of our sleeping time and some of our most restful and restorative sleep.[142]

The half-life of caffeine is four to five hours but varies by individual. If you use birth control, the half-life of caffeine doubles (stays longer in your body). Smokers process caffeine twice as quickly, so the half-life of caffeine for them is two to two and a half hours. Weight is another variable for the half-life of caffeine.

Coffee spikes cortisol, the stress hormone, which at chronic high-levels can cause disease in the body. Caffeine also increases heart rate and blood pressure and adds the risk of heart arrhythmias.

Energy drinks with large amounts of caffeine are known for the risk of cardiac arrhythmia and seizures.[143]

Decaffeinated coffee is not an ideal alternative. To remove caffeine, coffee beans are washed in solvents before roasting (solvents include benzene, a potentially toxic hydrocarbon, ethyl acetate, and methylene chloride).[144] Methylene chloride, also used in paint strippers, is so toxic that in 2016, the EPA proposed the ban of selling products with methylene chloride. Decaf is also not caffeine-free. A standard cup of decaffeinated coffee still can have one to 7 mg of caffeine, which is more caffeine than some caffeinated teas have.[145]

Caffeine Regulation in Other Countries

Canada requires that products that contain caffeine must be sold as food and not as dietary supplements. The caffeine content must be listed, and the packaging must include a warning label saying the product is not recommended for pregnant women or children. Canada also bans juices and noncarbonated drinks that contain caffeine.

Drinks in Europe with more than 150 mg of caffeine must carry a label warning for its high caffeine content, and the specific caffeine content must be listed. The wording must appear within the same field of vision as the name of the drink.

The United States has no significant caffeine regulations.

Some coffee drinkers have to drink coffee all day to feel alert. Many individuals are so used to functioning on caffeine that they then need to drink some wine to get to sleep. It’s a vicious cycle. Too much alcohol also harms the adrenals and detoxification pathways. Some people use coffee to sharpen their mental focus and boost their

energy, but many daily users drink coffee simply to stave off caffeine withdrawal symptoms.

Try removing caffeine from your diet, and you may finally break free from the addictive grips of caffeine. Your adrenals will thank you for it.

Antinutrients

Antinutrients are natural compounds found in plants. Antinutrients protect plants from bacterial infections and protect plants from being eaten by predators. Since plants can't fight off predators, antinutrients are a plant's self-defense mechanism, causing interference with nutrient and mineral absorption. The overconsumption of any suspect plants will cause illness and malnutrition and eventually cause humans, animals, and other predators to stop eating them.

Antinutrients are found in all parts of plant-based foods, including vegetables, seeds, and fruits. We consume every part of the plant: the roots (carrots), tubers (potatoes), stems (celery), leaves (spinach), bulbs (onions), seeds (includes beans, grains, and nuts), and fruits (apple). Too many antinutrients can cause inflammation, gut dysbiosis, arthritis, joint pain, skin issues, and brain fog.[146]

A big concern of antinutrients is how they adversely affect nutrient absorption of foods eaten alongside these edible plants. It's difficult to gauge how many nutrients are lost by eating plant-based foods high in antinutrients. You can take serum levels after eating a certain amount of plants daily, but the results will vary according to the health of the body, the genetics of the person, the source of the food, and how the food is prepared.

Some antinutrients are not as toxic to the human body, so long as they are consumed in moderation and properly prepared. Traditionally, societies soaked and sprouted plant-based foods to remove some of the toxins and allow nutrients in foods to be more readily absorbable by the body. But not all antinutrients can be removed with soaking and sprouting.

ANTINUTRIENTS IN PLANT FOODS

ANTINUTRIENT	PLANT FOODS WITH HIGH AMOUNTS			
Flavonoids	• Apples • Asparagus • Black tea	• Broccoli • Cherry tomatoes • Chocolate	• Grapefruits • Green tea • Leafy greens	• Onions • Pomegranates • Raspberries
Glucosinolates	• Bok choy • Broccoli • Brussel sprouts	• Cabbage • Cauliflower • Collard greens	• Horseradish • Kale • Kohlrabi	• Mustard greens • Turnip greens • Turnip roots
Gluten	• Barley • Couscous • Durum flour	• Farina flour • Graham flour • Kamut	• Rye • Seitan • Semolina	• Spelt • Triticale • Wheat
Lectins	• Beans • Corn • Grains	• Legumes • Melon fruits • Nuts	• Peppers • Pumpkins • Tomatoes	• Seeds • Soy • Squash
Oxalates	• Almonds • Cinnamon • Dark chocolate	• Grains • Nuts • Peanuts	• Potatoes • Raspberries • Seeds	• Spinach • Turmeric • Yams
Phytic acid (Phytates)	• Almonds • Beans • Chard	• Dark chocolate • Garbanzo beans • Grains	• Legumes • Nuts • Peanuts	• Soy • Spinach • Seeds
Polyphenols	• Apples • Berries • Broccoli	• Cherries • Cherry tomatoes • Coffee	• Dark chocolate • Grapes • Oranges	• Peaches • Red onions • Spinach
Protease inhibitor	• Broccoli • Brussel sprouts • Garlic	• Grains • Green tea • Legumes	• Nightshades • Onions • Potatoes	• Seeds • Sweet potatoes • Turnips
Salicylates	• Avocado • Berries • Carrots	• Chicory • Cucumbers & Pickles • Green olives	• Nightshades • Nuts • Pickles	• Pineapples • Prunes & Raisins • Spices
Saponins	• Alfalfa sprouts • All beans • Amaranth	• Chick peas • Grains • Green beans	• Legumes • Lentils • Licorice root	• Spinach • Quinoa • Yellow split pea
Solanine	• Ashwagandha • Capsicum • Curry powder	• Eggplants • Goji berries • Okra	• Paprika • Peppers • Spices	• Tobacco • Tomatoes • White potatoes
Tannins	• Apple • Beer • Berries	• Cocoa powder • Chocolate • Grains	• Grapes • Legumes • Nuts	• Pomegranates • Teas • Wines

Table 6.4. Antinutrients in Plant Foods.

Gluten

Gluten is a protein that is almost impossible for stomach acid to break down and digest. Instead of being digested and broken down into amino acids that are then absorbed by the small intestine, glutens end up, undigested, in the small intestine. When the small intestine tries to absorb these long-chain amino acids, problems may arise, such as a breakdown of the tissue in the small intestine. Remember, the more the small intestine breaks down, the fewer nutrients the small intestine can absorb and send into the bloodstream.

Real oats do not have gluten but often are processed in the same facilities as gluten-containing grains. Oats have been widely genetically modified, and by now, you know how dangerous genetically modified plants and glyphosate are to the human body.

Gluten causes gut distress for many, as it is one of the most difficult plant proteins to digest. Gluten is the protein found in grains like wheat, rye, and barley. You don't need grains in an optimal diet. You have no biological need for carbohydrates, and you can obtain the nutrients in grains from other foods.

A severe allergic reaction to gluten usually signals Celiac disease, a severe autoimmune disease. It's so awful that if someone with Celiac disease consumes gluten, the body responds by attacking and damaging the small intestine. Even if you don't have Celiac disease, Dr. Alessio Fasano of Harvard, a gluten expert, says that anyone eating gluten is doing small amounts of damage to their intestinal lining daily and creating leaky gut and inflammation in the long run.[147]

If you think you'll simply swap grain foods for gluten-free foods, just because a food is gluten-free doesn't mean it's healthy. A gluten-free

cookie is still a sugar-laden cookie.

Many people are switching from wheat and gluten products to cassava flour. However, cassava flour is high in oxalate antinutrients and other natural toxins.[148] You may be merely swapping one toxin for another.

Phytic Acid (Phytates)

Phytic acid is primarily found in whole grains, legumes, seeds, and some nuts. Phytic acid can decrease the absorption of iron, zinc, magnesium, copper, phosphorous, and calcium. Studies show that phytates can block 80 percent of zinc-rich foods (cashews, chickpeas), 80 percent of phosphorous-rich foods (pumpkin seeds, sunflower seeds), and 40 percent of magnesium-rich foods (spinach, almonds, avocado).

One study showed that decreasing the phytic acid in porridge (oatmeal) improves iron absorption. Additionally, oatmeal has a high glycemic index, which means it is digested and absorbed quickly, leading to rapid spikes in blood sugar and subsequent hunger and cravings.[149]

Oatmeal does have nutrients, but most refined grains are enriched with nutrients like iron, folate, and B vitamins to replace nutrients lost during processing. But too often, the body doesn't absorb these nutrients because of the phytates. As a result, it's difficult to say how much nutrition you are getting from highly processed oatmeals.

Phytic acid also inhibits essential digestive enzymes, such as trypsin, amylase, and pepsin, from doing their jobs of supporting the digestive process. Amylase breaks down starches, and the body uses both pepsin and trypsin to break down proteins.

Lectins

Most plant-based foods contain lectins, but legumes (beans, peanuts, soybeans) and whole grains (wheat) contain the most. Lectins can interfere with nutrient digestion and absorption of calcium, iron, phosphorous, and zinc.

Lectins are notorious for surviving the gastrointestinal tract and causing havoc downstream in the digestive process. Studies have shown that undigested lectins can penetrate the cell lining of the digestive tract, damage its epithelial cells and membrane lining, change bacterial flora, and trigger autoimmune reactions. Lectins stick to the walls of the gut and cause low-grade inflammation. The gut usually repairs small holes caused when food moves around the stomach, but lectins inhibit this process. When you eat a lectin-rich diet, you have an increased risk of leaky gut because holes in your gut wall are not repaired, and food particles start entering your bloodstream.[150]

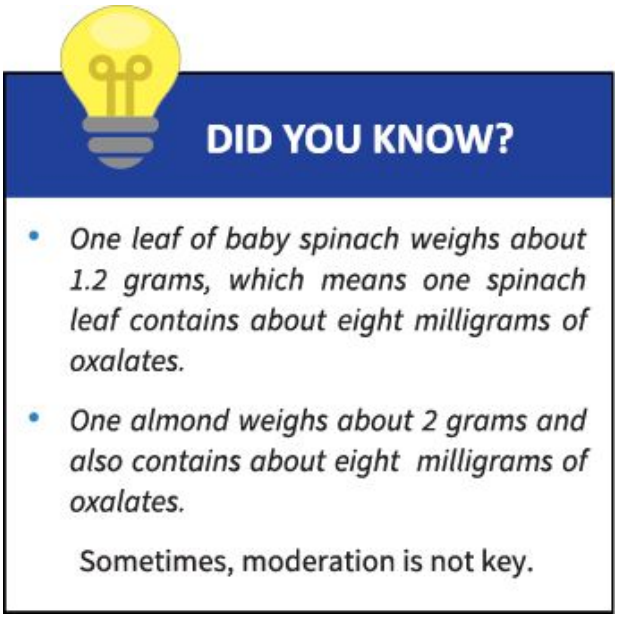
Lectins have been shown to cause red blood cells to stick together. Lectins in red kidneys beans can cause poisoning if raw or undercooked kidney beans are eaten. According to the USDA, consuming four raw kidney beans can cause severe nausea, diarrhea, and vomiting.[151]

An immune response to lectins can look like hives, rashes, and joint pain. Nightshades—the family includes tomatoes, potatoes, and peppers—are high in lectins and often trigger an autoimmune response.[152] Properly preparing some plants that contain lectins can reduce or remove some of them, but not nightshades and wheat.

Solanine, found in nightshades (potatoes, eggplants, tomatoes, peppers), can cause inflammatory bowel disease and autoimmune reactions. Some people may feel nausea, throat burning, and

headaches. Not everyone is adversely affected by nightshades, but all nightshades are high in lectins.[153]

Oxalates



Oxalates are found in green leafy vegetables (spinach), parsley, nuts, sesame seeds, blackberries, blueberries, raspberries, bran or high-fiber cereal, whole wheat, black tea, and soy products, among others.[154]

Oxalic acid is so toxic that beekeepers use it to kill off Varroa mites. Oxalic acid has only recently (2015) been approved for use in beehives in the United States. Although researchers aren't sure how oxalic acid kills mites, the toxicity comes from its acidity and binding properties. When ingested, as little as 5 to 15 grams of oxalic acid can cause death in humans. Even if it doesn't kill you, it can cause nausea, severe gut issues and vomiting, shock, convulsions, and even cardiovascular collapse. We don't consume oxalic acid in its pure form. Still, spinach broken down in the body can make oxalic acid, which then binds to calcium from the blood and forms calcium oxalates— sharp, tiny oxalic acid crystals. These crystals can then

precipitate into the brains, kidneys and get lodged all over the body.[155]

Oxalates are especially dangerous because they attack the mitochondria, the cells' powerhouse. When it attacks our energy source, we experience not only low energy but mood disorders. Oxalates target all the organs and tissues and can cause permanent cell damage.

FACTORS THAT AFFECT OXALATE METABOLISM	
METABOLITES	**SIGNIFICANCE**
Oxalic acid	• Extremely acidic organic acid that traps heavy metals and deposits in a variety of tissues throughout the body
Pyridoxic acid	• Major metabolite of vitamin V6 – high amounts of B6 shunt oxalate precursors to the form-ation of glycine instead of oxalic acid
Glycolic acid	• Byproduct of Candida prod-uced when Candida enzyme collagenase converts to hydroxyproline to glycolic acid. It is found elevated in the genetic hyperoxaluria type 1
Glyceric acid	• Found elevated in the genetic hyperoxaluria type 2
Arabinose, Tartaric acid	• Candida markers
5-hydroxy-methyl-furoic acid	• Metabolites of fungi as Asper-gillus that may produce oxal-ates directly
Ascorbic acid	• High oral or intravenous intake may lead to excessive oxalate production

Table 6.5. Factors that Affect Oxalate Metabolism.

A calcium-rich diet can prevent the accumulation of some oxalates as the oxalates will bind to the calcium. But this also means that the body will be stripped of the much-needed calcium. Often the body is deficient in calcium not because of inadequate amounts of calcium, but because of other factors that cause calcium deficiency. In this case, too many oxalate-rich foods can steal calcium from the body.[156]

Oxalates are also enzyme inhibitors that can interfere with proper digestion and cause gut problems and protein deficiencies. Enzymes create chemical reactions that help the body function properly. Enzymes are especially important in the digestive process. Without the enzymes to metabolize food properly, gastrointestinal problems can occur, such as bloating and constipation.

Oxalates may be reduced (but not significantly) by soaking in acid, boiling, cooking, and then draining the liquid. Yes, the vegetables in your bone broth may mean you are making a broth rich in antinutrients.

Oxalate toxicity is a very painful condition. You can learn more about the dangers of oxalate crystals from Sally Norton, an expert in oxalates. She has studied nutrition and received a master's degree in public health from the University of North Carolina, Chapel Hill.[157]

Oxalates and gut health. Diet is the primary source of oxalates, but mold, yeast, bacteria, and metabolic imbalance can also increase oxalates in the body. One example is vitamin B6 deficiency. As shown in Figure 6.6, enzyme pathways can break down and not function properly (glycolate hydropyruvate and lactate dehydrogenase). This then causes a backup of oxalate processing and removal, causing a build-up of crystals in the body.

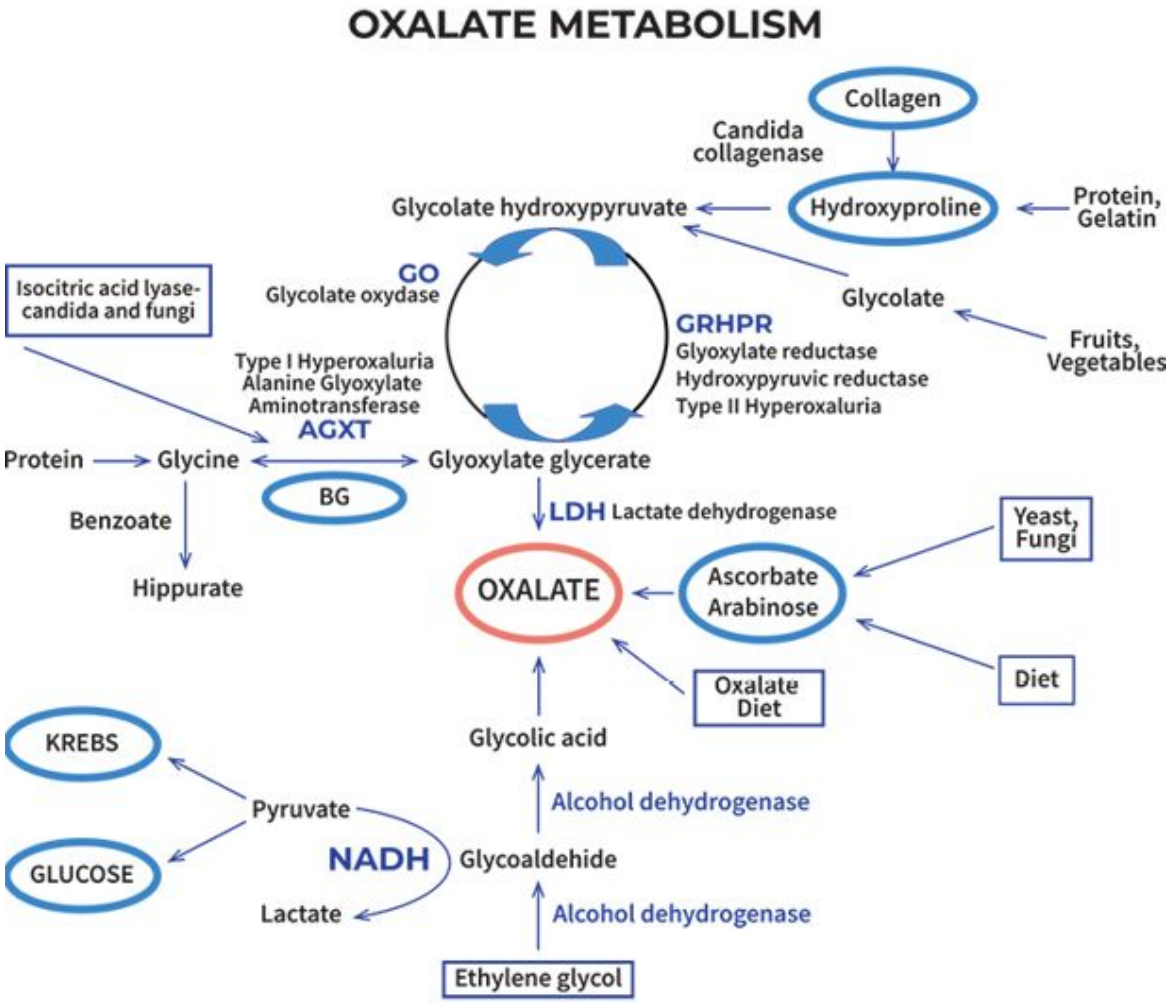
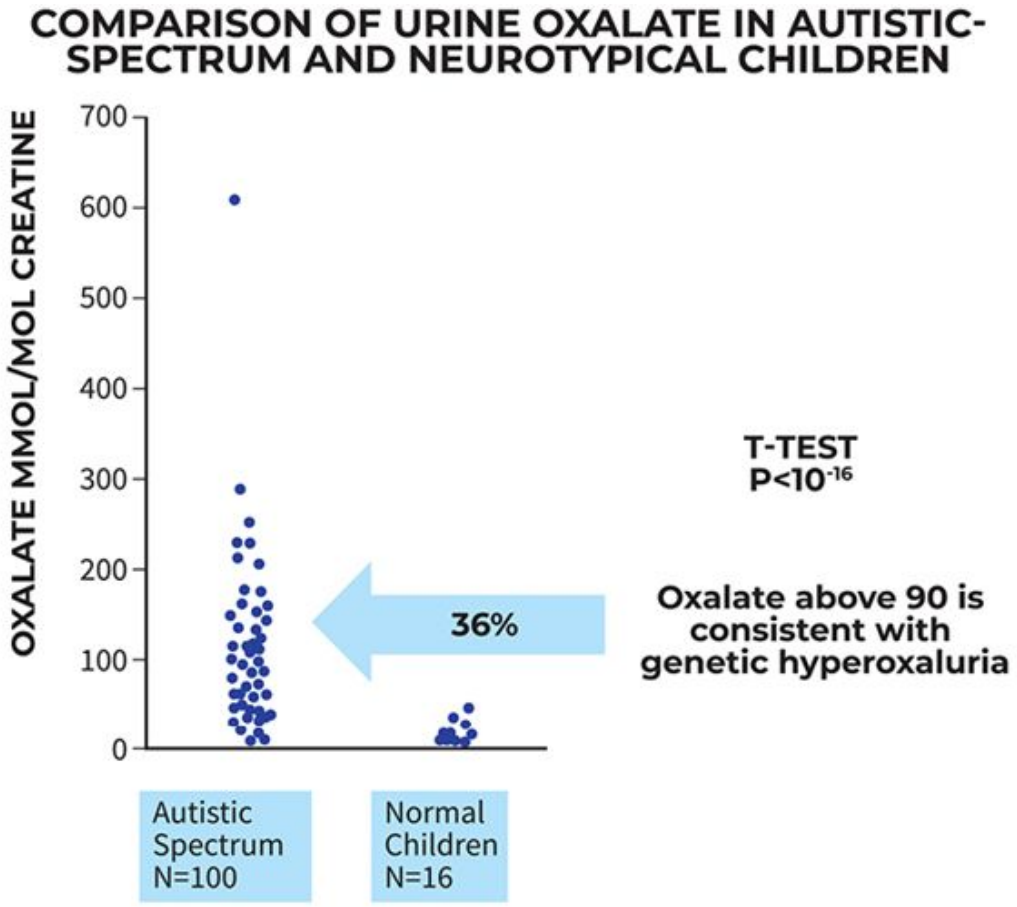


Figure 6.6. Oxalate Metabolism.



Statistic	Normal urine oxalate	Autistic Spectrum urine oxalate
Mean	15.7	90.1
Median	11.57	70.5
Std dev	10.8	75.8

Mean value for autism at 90.1 is at the lower cut-off for generic hyperoxalauria

Figure 6.7. Shaw, William, "Oxalate Control Is a Major New Factor in Autism Therapy," *Great Plains Laboratory*, (2006).

Candida and yeast also affect the number of oxalates in the body. Both can interfere with the removal of oxalates, which means more oxalate circulation in the body. Glycine, an essential amino acid, for

example, can feed into the oxalate pathway and make more oxalates—especially when vitamin B6 is low. It's easy to be low in B6 because the body doesn't store excess B6 (any water-soluble vitamins).

Having excess oxalates can be genetic, but glycolic acid, a metabolite detected in urine tests that form oxalates in the body, can often be a byproduct of candida. The symptoms usually are depression and low levels of neurotransmitter function—such as serotonin and dopamine. Oxalates can also impair enzymes dependent on biotin (vitamin B8), and studies show a correlation between urinary oxalates and autism (reference Figure 6.7).[158]

HIGH HYDROXYPROLINE FOODS

If you have signs of oxalates dumping or signs of yeast or bacteria overgrowth, you may want to skip out on supplemental collagen.

Collagen supports are often heavily in the form of hydroxyproline and while it may produce more collagen in the body, it can also be used as the substrate to make oxalates.

A sample serving of collagen peptides contains about 20,000 mg, of which 4,050 mg is hydroxyproline and 3,719 mg of glycine. Many individuals take two servings of collagen peptides daily (40,000 mg). The following are hydroxyproline amounts in real foods. With excess, you risk adverse imbalances in the body.

FOOD	AMOUNT PER 100 G	
Hydrolyzed bovine collagen peptides	• 100,000 mg	
Ostrich, raw	• 361 mg	
Ground beef, 85% lean /15% fat, raw	• 356 mg	
Ground venison, raw	• 313 mg	
Ground bison, raw	• 253 mg	
Beef sirloin, raw	• 213 mg	
Chuck roast, raw	• 197 mg	
Pork bacon, raw	• 190 mg	
Ground chuck, raw	• 149 mg	
Pork rib, raw	• 50 mg	
Beef liver, raw	• 46 mg	
Pork shoulder, raw	• 45 mg	
Beef suet, raw	• 16 mg	

Table 6.8. USDA Nutritional Database.

HIGH GLYCINE FOODS

Glycine can also feed into the oxalate pathway, especially when vitamin B_6 is low. Vitamin B_6 is critical, even on a low oxalate program.

One serving of gelatin powder has about 3,500 mg and 1,700 mg of additional hydroxyproline. One serving of glycine powder has 2,000 mg.

FOOD	AMOUNT PER 100 G	
Gelatin, dry	• 19,051 mg	
Ground beef, 85% lean /15% fat, raw	• 1,251 mg	
Shrimp, raw	• 1,225 mg	
Turkey, baked	• 1,175 mg	
Beef liver, raw	• 1,164 mg	
Crab, Dungeness	• 1,050 mg	
Ribeye, raw	• 955 mg	
Octopus, raw	• 933 mg	
Pork chop, raw	• 933 mg	
Chicken, baked	• 920 mg	
Lamb chops, raw	• 894 mg	
Salmon, raw	• 869 mg	
Chicken liver, raw	• 849 mg	
Pork bacon, raw	• 814 mg	
Oyster, Pacific	• 591 mg	
Beef suet, raw	• 91 mg	

Table 6.9. USDA Nutritional Database.

Oxalates and collagen (L-Hydroxyproline). If you are struggling with oxalates or overgrowth of yeast or bacteria in the gut, hold off on

bone broth and focus on meat stock for minerals and nutrients. Most people should avoid collagen peptides, powders, and supplements unless advised by a medical practitioner. The bone broth and collagen supplements people consume are most often in the form of L-Hydroxyproline, an amino acid that the body can absorb and needs as a raw substrate to make collagen. Unfortunately, L-Hydroxyproline is also the raw substrate needed to make oxalates.[159]

What does this mean?

You can consume all the bone broth, collagen powder, and glycine you want, but the body decides whether they become the amino acid, L-Carnitine and collagen, or oxalates and glyoxylate.

How do we know which path the body will choose? We don't. What the body does may depend on the pH of the cells, enzyme availability, coenzyme availability, and many other factors. The body will probably make a little bit of everything, depending on what it needs. The body can initially use bone broth and collagen supports (in L-Hydroxyproline form) to make collagen, but if the body has excess collagen, it may use the L-Hydroxyproline to make glyoxalates. Glyoxalates or oxalate crystals can be stored anywhere in the body.

Many people take collagen for joint support, but doing so can cause more joint issues due to excess oxalates formed in the body. The same can be said for turmeric. Turmeric is popular as a prophylactic for joint pain. But it is extremely high in oxalates and, therefore, can exacerbate joint pain and inflammation. Table 6.10 depicts the foods highest in oxalates per 100 gram serving.

You may be more susceptible to oxalate toxicity if you have a history of kidney stones or if kidney disease runs in your family.

Oxalates and neurotransmitters. Most neurotransmitters—such as norepinephrine—are created in the gut, and bacterial overgrowth can affect your mood. Yeast has also been found to harm neurotransmitters. One study showed that men with schizophrenia or bipolar disorder tested positive for candida more often than men without candida. Clostridia, a bacterial pathogen, also affects the brain and nervous system, causing fatigue, low mood, depression, and anxiety.[160]

FOODS HIGH IN OXALATES

The following are some of the highest oxalate foods per 100 g serving.

FOOD	AMOUNT PER 100 G	
Turmeric powder	• 2,190 mg	
Sesame seeds, dried	• 2,175 mg	
Poppy seeds	• 2,157 mg	
Cinnamon	• 1,680 mg	
Spinach, raw	• 1,145 mg	
Caraway seeds	• 994 mg	
Swiss chard, raw	• 964 mg	
Almonds, raw	• 465 mg	
Cashews, raw	• 264 mg	
Hazelnuts, raw	• 209 mg	
Plantain bananas	• 196 mg	
Brazil nuts	• 192 mg	
Roasted peanuts	• 187 mg	
Peanut butter	• 166 mg	
Macadamia nuts, raw	• 142 mg	
Dark chocolate truffle	• 140 mg	
Quinoa flour	• 140 mg	
Potato Flour	• 108 mg	
Baked Yam	• 105 mg	

Table 6.10. Foods High in Oxalates.

Reduce oxalate foods, heal candida overgrowth, increase vitamin B6 (vitamin B2 aids in the production of vitamins B3 and B6), and possibly add therapeutic doses of biotin. Always work with a practitioner. Too much of any nutrient or self-doctoring can become harmful.

If you have a meal high in oxalates, take calcium, magnesium citrate, and even dairy with the meal. They can help mitigate the body's absorption of the oxalates by binding to them and help excrete the oxalates from the body. Remember, this also means that your body will not absorb most of the calcium and magnesium in your meal.

If you are concerned about oxalates, you can functionally test for amino acid profiles and neurotransmitter, candida, and oxalate metabolites via urine tests. You should also get a kidney function test panel via a blood draw. You can learn more at www.carnivorecure.com/resources.

Minimizing oxalate-rich foods is ideal. People who have kidney stone removal surgery are told to follow a low-oxalate diet protocol after being discharged from the hospital. Remember: mold, yeast, bacteria, and metabolic imbalances can cause oxalate accumulation in the body, but the main culprit is diet.

Salicylates

Salicylates are chemicals naturally found in fruits and vegetables and some medications. Some individuals have sensitivities, and others have anaphylactic (IgE) response to salicylates. Other reactions may include asthma, headaches, changes in skin color, skin irritation, stomach pain, and nasal congestion.[161]

FOODS HIGH IN VITAMIN B_6

These foods are good sources of vitamin B_6. Vitamin B_6 enables the brain to produce serotonin and dopamine, keeps oxygen circulating, prevents kidney stones maintains immune health, and supports cardiovascular health. (USDA)

FOOD	AMOUNT PER 100 G	
Beef liver, raw	• 1.1 mg	
Chicken liver, raw	• 0.9 mg	
Ground turkey, raw	• 0.9 mg	
Chicken breast, raw	• 0.8 mg	
Turkey breast, raw	• 0.8 mg	
Pork tenderloin, raw	• 0.8 mg	
Salmon, wild, raw	• 0.8 mg	
Beef round, raw	• 0.7 mg	
Beef chuck, raw	• 0.6 mg	
Salmon, farmed, raw	• 0.6 mg	
Octopus, raw	• 0.6 mg	
Tuna, canned	• 0.5 mg	
Egg yolk, raw	• 0.4 mg	

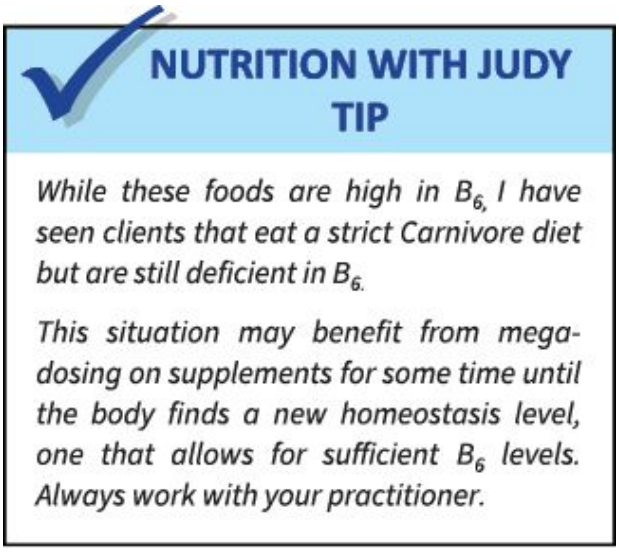
Table 6.11. Foods High in Vitamin B6.

Some people seek a low salicylate diet and experience fewer reactions from foods. People with histamine sensitivities also may have salicylate sensitivities. By removing foods high in both histamines and salicylates from your diet, you may improve your body's food reactions.

Tannins

Tannins are found in grapes, teas, coffees, wines, and legumes and can interfere with iron absorption. Tannins have also been shown to impede the digestion of nutrients. Tannins block the body from absorbing nutrients that are naturally available for digestion and absorption.[162]

Tannins are another reason I recommend that you not drink diuretics (wine, coffee, teas) with meals. If you are drinking wine, coffee, or tea while eating meals, you may be impairing your body's ability to absorb nutrients from your foods. All diuretics impair stomach acid during the digestive process. Fermentation or heat can break tannins down, but some tannic acids will remain.



Tannins are a class of polyphenols. Polyphenols are antinutrients that have been touted for their health benefits. Dark chocolate, flaxseed meal, cocoa powder, and many fruits and vegetables contain polyphenol compounds. Their health benefits may include body weight regulation and lowering blood pressure.

However, studies have found that high doses of polyphenols cause kidney damage, tumor development, and altered thyroid hormone production. They can also impair the digestion of nutrients.[163]

Flavonoids and Isoflavones

Flavonoids are also part of the polyphenol family. They are found in teas, coffee, and some whole plants. There are benefits to drinking green tea and coffee, but even these good flavonoids inhibit mineral absorption. Flavonoids are not the only reason you should be careful about drinking green and black tea—both are high in oxalates.

Some recent studies show flavonoids improve blood sugar levels. That may be beneficial for people who refuse to give up processed sugar, and increasing their consumption of flavonoids is better than nothing. But if you give up processed sugars, you do not need foods that improve blood sugar levels.[164]

Isoflavones, found in soybeans, are another polyphenol antinutrient. Isoflavones are classified as phytoestrogens because they can have estrogen-like effects. A meta-analysis study showed a correlation between the consumption of soy isoflavones and an increased risk of breast cancer and other diseases.[165]

Glucosinolates

Glucosinolates are found in cruciferous vegetables (broccoli, kale, brussels sprouts) and can interfere with the absorption of iodine, which can then impair thyroid function. You may be sensitive to glucosinolates if you have hypothyroidism (underactive thyroid) or are iodine deficient (iodine is needed to produce thyroid hormone). Make sure you have sufficient levels of iodine. Most people get their iodine from table salt, algae, and certain seafood. If you don’t eat these foods, then supplementing iodine drops may be necessary. Eggs do have iodine but even consuming several eggs a day may be insufficient.

Eating cruciferous vegetables causes some of the toxins. Breaking down these plant-based foods in the mouth causes chemicals to

combine and create toxins (isothiocyanate) in the body. One type of isothiocyanate is sulforaphane, which has been shown to impair mitochondria health and damage human epithelial cells, causing leaky gut.[166]

Multi-year studies with 200,000 health professional participants found those who consumed more glucosinolates had a 19 percent greater risk of type 2 diabetes than participants who consumed the fewest number of glucosinolates. This was the case even after adjusting for diabetes risk factors. Those with the highest risk consumed brussels sprouts at least once a week compared with those who never ate brussels sprouts.[167]

Stay away from brussels sprouts—they are higher in glucosinolates (104 mg per half cup) than broccoli (27 mg per half-cup). If you love your cruciferous vegetables, boiling can cut the number of glucosinolates by as much as 50 percent.[168]

GLUCOSINOLATE CONTENT OF CRUCIFEROUS PLANTS

FOOD (RAW)	SERVING	GLUCOSINOLATES
Brussels sprouts	¼ cup (44 g)	104 mg
Garden cress	½ cup (25 g)	98 mg
Mustard greens	½ cup (28 g)	79 mg
Turnip	½ cup (65 g)	60 mg
Mustard greens	½ cup (28 g)	79 mg
Cabbage, savoy	½ cup (45 g)	35 mg
Watercress	1 cup (34 g)	32 mg
Kohlrabi	½ cup (67 g)	31 mg
Cabbage, red	½ cup (45 g)	29 mg
Broccoli	½ cup (44 g)	27 mg
Horseradish	1 tbsp (15 g)	24 mg
Cauliflower	½ cup (50 g)	22 mg
Bok choy	½ cup (35 g)	19 mg

ISOTHIO-CYANATE	PRECURSOR GLUCOSINOLATE	FOOD SOURCES
Allyl isothiocyanate	Sinigrin	Broccoli Brussels sprouts Cabbage Horseradish Kohlrabi Mustard Radish Sprouts
Benzyl isothiocyanate	Glucotropaeolin	Cabbage Garden cress
Phenethyl isothiocyanate	Gluconasturtiin	Watercress
Sulforaphane	Glucoraphanin	Broccoli Brussels sprouts Cabbage Cauliflower Kale

Table 6.12. Higdon, Jane," Isothiocyanates," Linus Pauling Institute, (2005).

Other Problematic Compounds in Fruits and Vegetables

Saponins, found in legumes (green lentils) and whole grains, can interfere with the absorption of the nutrients iron and zinc. Saponins are similar to lectins in that they can affect the gastrointestinal lining, causing leaky gut and autoimmune responses.

Trypsin inhibitors, which can cause mineral deficiencies in infants, children, and people with pancreatic disease, are found in legumes and grain products (cereals, porridge, baby foods). Studies show that cooking can remove some trypsin inhibitors.[169]

Protease inhibitors are plant compounds that inhibit the absorption of proteins from foods eaten with plants that have these inhibitors. These block enzymes that usually break down proteins.

Protease inhibitors are found primarily in seeds, grains, legumes, tubers (potato), and green tea. Because protease inhibitors inhibit enzymes, they are used to break down bacteria, viruses, and fungi. They are perhaps best known for their use in antiviral drugs commonly used to treat HIV, AIDS, and Hepatitis C.[170]

Spices

Spices, unfortunately, contain many of the antinutrients I have discussed. As dried, many are turned into a powder and therefore have even higher concentrations of antinutrients. Many spices also contain additives to maintain freshness and peak flavors. One study found imported spices used dyes, and because the concentration of these dyes far exceeded government guidelines, they were later recalled. If you are using a variety of spices, you might be consuming more dyes than is safe. Both artificial and natural dyes are used for spices, but both can be toxic.[171]

While natural additives can be considered safe, in 2011, sesame seeds were found to contain rhodamine B. These pink colored sesame seeds were colored with rhodamine B, which is an industrial dye and not allowed on food anywhere in the world. Yet somehow it was on these sesame seeds.

Table 6.13. Norton, Sally, "Beginner's Guide, Oxalates."

Toxic industrial dyes may not be used to color any foods. These dyes are so toxic that some people have used them to commit suicide.[172]

If you want to use spices, buy the highest quality spices. You can buy garlic powder for a dollar or two, but the same size container

from a higher quality source can cost more than ten dollars. Some spices—those that are higher in oxalates—you may decide to stop using Table 6.13 provides you spice swaps for high oxalate plant-based spices. This list does not consider any other antinutrient or plant-based toxins.

Soy

Soy is in everything. (Hydrogenated) soybean oil, soy milk, tofu, vegetarian meats, miso, edamame, soy sauce, the list goes on. Soybean oil is the “vegetable oil” in almost every mayonnaise and salad dressing on market shelves. These are almost always oxidized, causing a high amount of inflammation in the body.

Chickens weren’t meant to eat soy any more than humans were. Soy can impair the growth of chickens because it contains enzyme inhibitors and can cause nutritional deficiencies in manganese, iron, vitamin E, calcium, and zinc. Farmers have to cook and process soy for chickens to consume it, a significant indication that chickens—and perhaps humans—should not be eating soy.

Some chickens have to be given iron supplements because soybean proteins tend to leave chickens with iron and vitamin E deficiencies (unlike chickens raised on casein). Chickens with a zinc deficiency may have abnormally formed bones and issues with their legs. These deficiencies can cause their eggs and meat to be less nutrient-dense, and these chickens are likely to die earlier than their pasture-range counterparts.[173]

Worse, almost all soy in the United States has been genetically modified. That means that soy contains antibiotic-resistant markers and (for now) “considered relatively safe for human consumption.” These crops can be sprayed with much heavier pesticides and other

toxic chemicals and survive because of their genetic modifications.[174]

Finally, soy is high in phytoestrogens, which disrupt hormones. They mimic estrogen and may cause obesity and cancer. During menopause, some women do take phytoestrogens, but these also can disrupt the endocrine system (the hormone system) and cause downstream health issues.[175]

Pea Protein

More awareness of the dangers of soy is causing manufacturers of plant-based foods to turn to a new plant protein—pea protein.[176]

Pea protein is extracted from yellow peas. I discussed the antinutrients in legumes, but there are other concerns about pea protein. Pea protein is technically a complete protein because it has all nine essential amino acids, but only trace amounts of methionine, which is not enough for optimal health.

Although too much methionine can have adverse health effects, and recent studies show some evidence that restricting methionine can starve cancer cells, methionine is still an essential amino acid. Methionine supports the metabolism of several compounds and supports the growth of new blood vessels.[177]

Pea proteins are not regulated by the FDA (because they're considered supplements), so manufacturers are not required to provide nutritional values. Extracting proteins from dry peas most likely remove most nutrients, but the manufacturers are not required to share that information. Peas contain folate, magnesium, and potassium, but without labels, there is no way to know how much of these the pea protein powders retain.

Many pea protein powders also contain toxins such as arsenic, cadmium, and lead. In 2018, the Clean Label Project found plant-based products carried the highest levels of toxins, and seventy-five percent of the 134 protein powders contained lead.[178]

People with low kidney function should consult with their medical team before consuming pea protein. Pea proteins are high in purines, which can convert to uric acid. Purines aren't dangerous in normal amounts, but excess amounts can make poorly functioning kidneys have difficulty reducing uric acid. The concentration of purines in pea proteins is not natural and can exacerbate uric acid build-up and the inflammatory condition gout.[179]

If you want to eat peas, eat the real thing.

All plant-based foods contain some level of toxins and antinutrients. Some antinutrients inhibit enzymes (sparkplugs that help support function) and nutrient absorption in the body. Then how does the consumption of plant-based foods, high in antinutrients, support optimal health?

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Chapter 7

How to Eat Plants: Soaking, Sprouting, Peeling, and Deseeding

Poison is in everything, and no thing is without poison. The dosage makes it either a poison or a remedy.

—Paracelsus

IT IS IMPOSSIBLE to remove all antinutrients and every enzyme inhibitor in plant-based foods. There is a way to lessen antinutrients with proper preparation, but not all toxins will be removed. If you incorporate plant-based foods, the key is to properly prepare and cook them so that the nutrients become easier to digest and absorb and, most importantly, that some of the antinutrients are removed.

Cooking and heat do cause a loss of nutrients, about 10 to 25 percent. Cooking reduces antioxidants in broccoli, but it can make other nutrients more readily available for the body. Fat-soluble vitamins (A, D, E, and K) stay intact better than water-soluble vitamins (vitamins C and B-complex). Heat usually does not affect minerals.

In terms of gut health, eating raw vegetables is far worse than cooked vegetables, often because of its lignin content. Lignins are structural polymers that give plants their shape and rigidity. Researchers have found evidence that lignins bind to nutrients and may even prevent their absorption. The argument for eating cooked plant-based foods is that lignins are partially absorbed by the gut and turned into short-chain fatty acids—essentially, fuel for the gut.[180]

Soaking and Sprouting

If you consume plant-based foods, proper preparation is critical. Soaking and cooking can reduce the antinutrients, which is why kidney beans and soybeans can be eaten when cooked but never raw.

Soaking legumes, including beans, overnight breaks down antinutrients and makes nutrients more readily available. The skin of legumes and beans contains most of their antinutrients, and break down when the beans are soaked.[181]

To give you some idea of what happens to antinutrients, twelve hours of soaking decreases the phytate content of peas by 9 percent, at most. Soaking pigeon peas and cowpeas 6 to 18 hours decreases lectins by 38 to 50 percent, protease inhibitors by 28 to 30 percent, and tannins by 13 to 25 percent. While that may sound good, that means that the majority of antinutrients are still intact.[182]

Additionally, soaking grains and legumes low in phytase will have little effect on their phytic acid. Remember, phytic acid decreases the absorption of iron, zinc, magnesium, copper, phosphorous, and calcium. For example, soaking dried millet, soybeans, sorghum, mung beans, and maize (corn) at 92 degrees Fahrenheit for twenty-four hours decreased phytic acid 4 to 50 percent. Soaking at room temperature for twenty-four hours reduced phytic acid by only 16 to 21 percent.[183]

Soaking plants in acid (vinegar) and consuming more foods rich in magnesium and zinc may decrease the number of oxalates—the main culprit in kidney stones—absorbed by the body. Soaking can decrease oxalates in some leafy vegetables, but not all. Oxalates are difficult to remove, even with proper preparation methods.

Soaking kidney beans, fava beans, and soybeans minimally reduced protease inhibitors, which block enzymes that break down proteins. The other option is to lower your risk of unpleasant effects and nutritional deficiencies by removing high antinutrient plant-based foods from your diet.[184]

SOAKING AND SPROUTING TIMES

Traditional cultures soak and sprout grains, legumes, nuts, and seeds. This helps neutralize antinutrients, increases the bio-availability of nutrients and increases digestibility.

Without soaking and sprouting, grains can create excitotoxins and endocannabionoids in the body. If you consume these foods, make sure you at least soak and sprout these antinutrient rich foods.

FOOD	SOAK	SPROUT
Almonds	• 8-12 hours	• 12 hours
Black beans	• 8-12 hours	• 3 days
Buckwheat	• 15-20 mins	• 2-3 days
Cashews	• 2-8 hours	• none
Chickpeas	• 12 hours	• 12 hours
Flaxseeds	• 30 mins	• none
Lentils	• 7 hours	• 2-3 days
Millet	• 5-7 hours	• 12 hours
Mung beans	• 8-12 hours	• 4 days
Oats	• 6 hours	• 2-3 days
Pistachios	• 8 hours	• 2-3 days
Pumpkin seeds	• 8 hours	• none
Sesame seeds	• 8 hours	• 1-3 days
Sunflower seeds	• 2 hours	• 2-3 days
Quinoa	• 4-8 hours	• 2-3 days
Wild rice	• 9 hours	• 3-4 days

Table 7.1. Soaking and Sprouting Times.

Fermentation

Fermentation can also break down antinutrients, mainly because of the acidity. Fermentation can improve the digestibility of plant-based foods and the ability of the body to absorb their nutrients. Lactic acid fermentation—such as sauerkraut and kimchi—can break down phytic acid and make minerals more readily available in plant-based foods to digest and absorb.

If you have a histamine intolerance, you'll want to avoid fermented foods because fermentation substantially increases histamine levels. Remember, the prebiotic benefits of fermented foods can also feed harmful bacterial overgrowth. Fermented foods are great for gut health but not for all gut dysbiosis. Fermented foods can feed the bad yeast in some people.

Removing Skin and Seeds

The skin of a plant is its protection from the outside world. And the seeds are what allows the plant to produce offspring—no wonder the skin and seeds may contain most of the plant's antinutrients. Also, pesticides and herbicides are used on food plant crops; and washing will not remove all the residues of these toxic substances from the skin.

I leave the skin on the organic apples my children eat, as the fibrous skin slows the absorption of some of the fructose in their bodies. However, given the apple's exposure to natural pesticides, I'm not sure whether I should keep the skin on, after all. We should not have to make these kinds of decisions about foods.

Other Options

Eat small amounts of the foods that contain antinutrients, so you are not consuming a heavy load of antinutrients all at once. Also, do not

consume them along with meals. For example, drink tea between meals, so it is not interfering with your iron absorption. Or take a calcium supplement a few hours before eating grains and legumes, high in phytates. By not eating them alongside your animal-based foods, you can ensure your body will absorb more of the nutrients in meat.

In terms of nuts, seeds, grains, and legumes, the ideal response is to stop eating them. They have too many antinutrients and cause more harm to the body, even in small amounts. Over time they can damage the body, especially gut health. Without a healthy gut, you lose the ability to digest and absorb nutrients, subsequently, damage the immune system, and likely suffer a decline in mental health.

A Thought

If companies with genetically modified foods care about feeding the world and doing well by humanity, why not use their skills to remove antinutrients from edible plants?

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Chapter 8

Bioavailability of Proteins and Fats

To eat is a necessity but to eat intelligently is an art.

—Unknown

So antinutrients aren't ideal. But what about nutrient profiles in plant-based foods? Surely, broccoli or blueberries have just as many nutrients as meat without the risk of heart disease?

This is where bioavailability becomes critical.

Bioavailability refers to the nutrients that are readily available for the body to absorb. It does not matter if the nutrients are in food per se. What matters most is whether your body can digest and absorb (or assimilate) the nutrients. Some foods become more bioavailable when cooked, whereas others are more bioavailable when raw or uncooked.

How can you know that meat is more bioavailable to your body and that your body better absorbs nutrients from meat than plant-based foods?

You can always get your nutrient profile checked before and after consuming a meat-only diet (best results will be after consuming meat-only for a minimum of 3 months) and then compare the results. Other tools, as well as studies, offer other means for measuring the bioavailability of meat and plant-based foods.

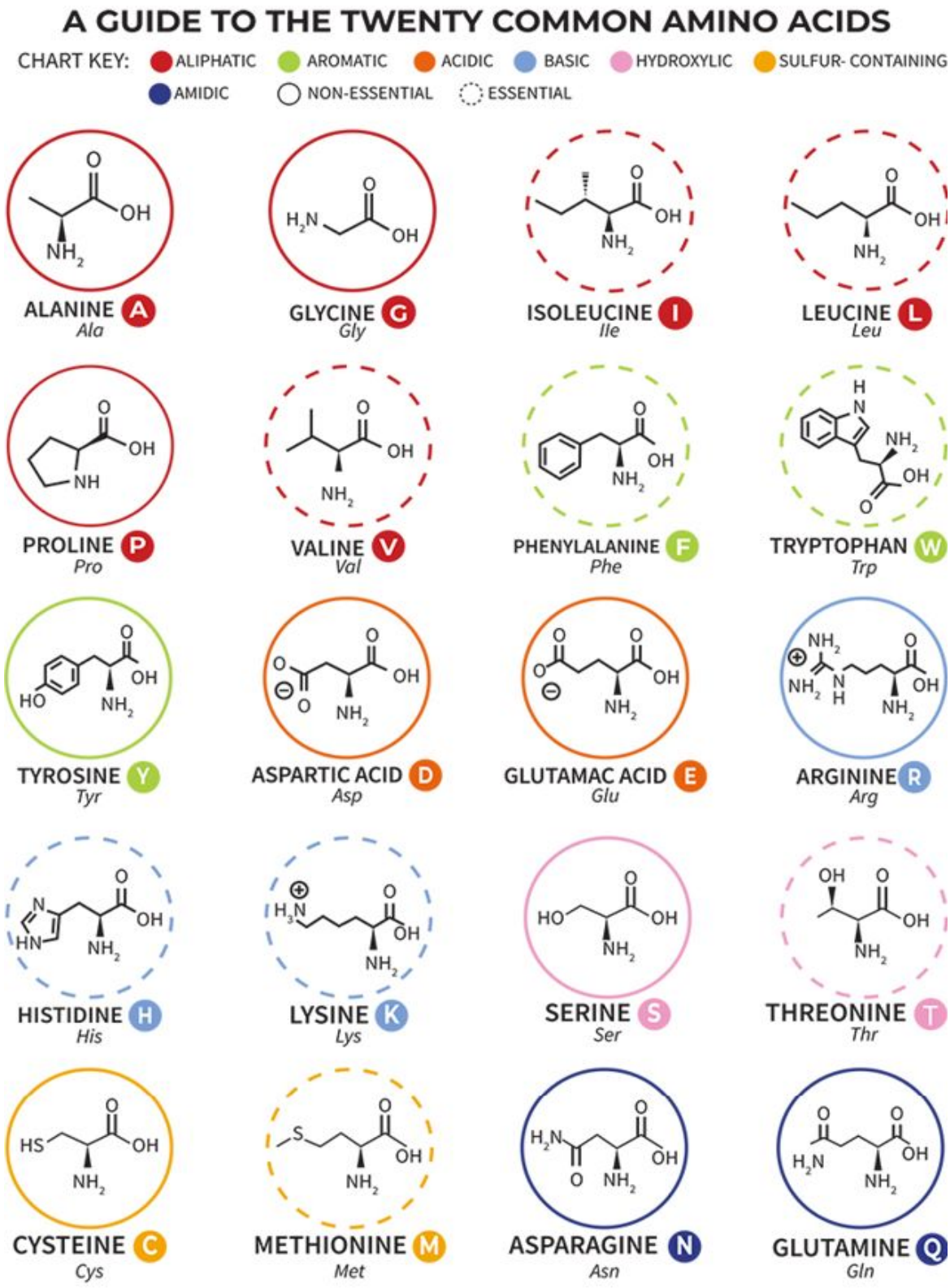


Figure 8.1. Twenty Common Amino Acids.

Protein Digestibility

Proteins are the building blocks of the human body. In Figure 8.1 you can the twenty most common amino acids of over 500 amino acids found in nature. The figure identifies sulfur-containing amino acids, essential amino acids and aromatic amino acids (remember from Chapter 5, glyphosate impacts aromatic amino acids).

The Protein-Digestibility Corrected Amino Acid Score (PDCAAS), devised by researchers working for the World Health Organization (WHO) and the Food and Agriculture Organization (FAO), measures the quality of a protein. It is based on both the individual's amino acid needs and their ability to digest these proteins.

The WHO-FAO test rates the essential amino acids in a protein. These are the amino acids from foods that the body needs for survival but cannot make on its own. If a protein food source is missing an indispensable amino acid, the resulting score is 0.

Some have criticized the test score for capping maximum digestibility scores at 100 and how it measures digestibility (from feces , as opposed to the small intestine). But it remains the primary method for figuring out the digestibility of proteins.[185] Table 8.2 shows different protein types and their protein digestibility scores (PDCAAS).

DIGESTIBILITY OF PROTEINS

The follow are PDCAAS scores for various protein types. Before PDCAAS scores, other ways to measure protein was with biological value (BV) protein efficiency ratio (PER) and net protein utilization (NPU). Both methods tried to score the utilization, digestibility and absorption of proteins and amino acids.

	PROTEIN TYPE	PROTEIN DIGESTIBILITY CORRECTED AMINO ACID SCORE (PDCAAS)	AMINO ACID SCORE	PROTEIN EFFICIENCY RATIO (PER)	BIOLOGICAL VALUE (BV)
1	Whey Protein	1.00*	1.14	3.2	100
2	Whole Egg	1.00	1.21	3.8	88-100
3	Casein	1.00	1.00	2.5	80
4	Soy Protein	0.99	0.99	2.2	74
5	Beef	0.92	0.94	2.9	80
6	Canned Kidney Beans	0.68	n/a	n/a	49
7	Wheat Gluten	0.25	0.47	n/a	54

*Note: Whey protein has a PDCAAS score of 1.14. The reported score is 1.0, which is the maximum value allowed by the USDA for reporting purposes.

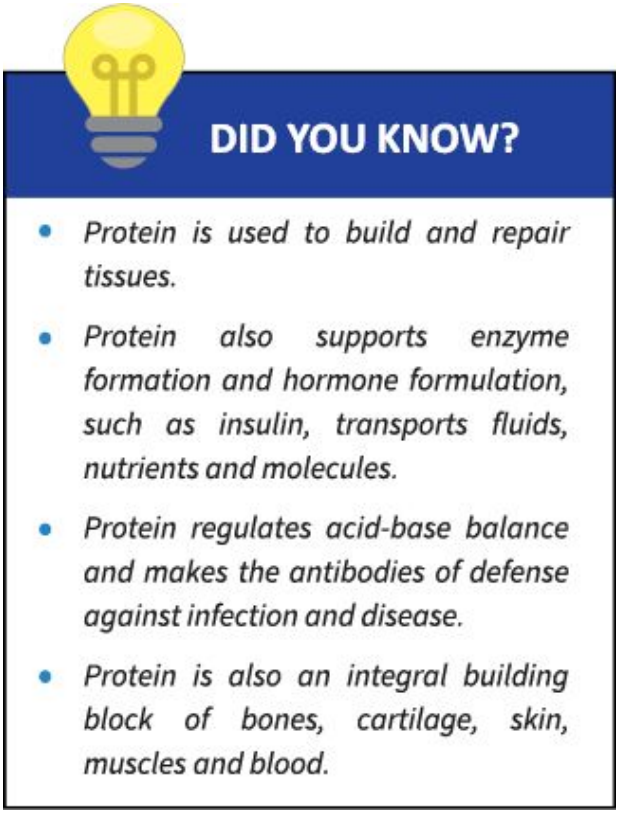
Table 8.2. Schaafsma, Gertjan, "The Protein Digestibility-Corrected Amino Acid Score," *Journal of Nutrition*, 130:7, (2000): 1865S-1867S.

However, partly due to the criticisms, the FAO introduced another test to measure protein digestibility in 2013 (DIAAS). It measures the digestibility of each amino acid in the protein source instead of providing a single number for that source—which is what the older test, PDCAAS, does.[186]

The FAO and WHO used the amino acid composition of human milk as a baseline for gauging the amino acid needs for children's foods, infants and older age groups (reference Table 8.3). The assumption behind using human milk for all age groups is that maintenance requires the same amino acid pattern per milligram or kilogram of body weight.[187]

That was how the adult protein requirement patterns were established; any growth was assumed to reflect the amino acid

makeup of the proteins in human tissue.



The new WHO-FAO analysis of individual amino acids puts the absorption of proteins from plant-based foods in a somewhat more favorable light than previously. The rankings of animal proteins have not changed and remain high in protein absorption, but this new amino acid measure (DIAAS) helps vegetable proteins look more attractive.

All protein-measuring practices have pros and cons, but they all find that proteins from animal foods are the most digestible and easily absorbed by the body. These protein digestibility tests do not factor in the role of antinutrients and their ability to hinder nutrient absorption.

As I've discussed, stomach acid, digestive enzymes, and overall gut health are critical to protein digestion.

AMINO ACID PROFILE OF BREAST MILK

The following is the dietary indispensable amino acid profile of human breast milk.

AMINO ACID	TOTAL PROTEIN
Histidine	21 mg/g
Isoleucine	55 mg/g
Leucine	96 mg/g
Lysine	69 mg/g
Methionine + Cystine	33 mg/g
Phenylalanine + Tyrosine	94 mg/g
Histidine	21 mg/g
Threonine	44 mg/g
Tryptophan	17 mg/g
Valine	55 mg/g

Table 8.3. FAO/WHO/UNU (2007).

CALCULATION OF DIGESTIBLE INDISPENSABLE AMINO ACID SCORE

The DIAAS for individual human-edible inputs and outputs are calculated as recommend by the FAO:

$$\text{DIAAS (\%)} = \frac{\text{mg of digestible indispensable amino acid in 1 g of the dietary protein}}{\text{mg of the same indispensable amino acid in 1 g of the reference protein}} \times 100$$

For the amino acid profile of the reference protein, the amino acid requirement pattern for a 6-month to 3-year-old child was taken.

Table 8.4. Ibid, Table 8.2.

RECOMMENDED AMINO ACIDS PROTEIN REQUIREMENTS

Recommended amino acid scoring patterns for infants, children and older children, adolescents, and adults.

AGE GROUP	HIS	ILE	LEU	LYS	SAA	AAA	THR	TRP	VAL
	Scoring pattern mg/g protein requirement								
Infant (birth to 6 months)	21	55	96	69	33	94	44	17	55
Child (6 months to 3 years)	20	32	66	57	27	52	31	8.5	43
Older child, adolescent, adult	16	30	61	48	23	41	25	6.6	40

Table 8.5. Ibid, Table 8.2.

Protein quality usually is more important than the quantity of protein consumed. You need stomach acid to break down proteins into amino acids for absorption. If you've been taking proton pump inhibitors (PPIs) for acid reflux, PPIs ultimately perpetuate low stomach acid. You may not be breaking down your proteins—making you, in effect, protein-deficient.

You can eat all the protein in the world, but if you do not have enough stomach acid, you will have protein deficiencies. And if you have leaky gut or other gut health issues, you will have other difficulties.

PROTEIN DIGESTIBILITY PDCAAS VS. DIAAS SCORES

This table shows the protein digestibility scores (PDCAAS and DIAAS) for various foods and any amino acids that are limited or missing.

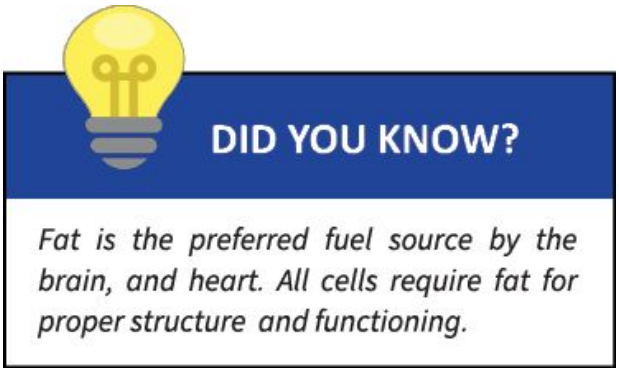
	FOOD	PDCAAS	DIAAS	LIMITING AA
1	Milk protein concentrate	1.00	1.18	Methionine, Cysteine
2	Whey protein isolate	1.00	1.21	Valine
3	Soy protein isolate	0.98	0.90	Methionine, Cysteine
4	Pea protein concentrate	0.89	0.99	Methionine, Cysteine
5	Rice protein concentrate	0.42	0.37	Lysine
6	Whole milk	1.00	1.14	Methionine, Cysteine
7	Chicken breast	1.00	1.08	Tryptophan
8	Egg (hardboiled)	1.00	1.13	Histidine
9	Cooked peas	0.60	0.58	Methionine, Cysteine
10	Cooked rice	0.62	0.59	Lysine
11	Almonds	0.39	0.40	Lysine
12	Chickpeas	0.74	0.83	Methionine, Cysteine
13	Tofu	0.56	0.52	Methionine, Cysteine
14	Corn-based cereal	0.08	0.01	Lysine
15	Hydrolyzed collagen	0.0	0.0	No tryptophan, Low in methionine

Table 8.6. Mathai, John, "Values for DIMS and PDCAAS." *Br J Nutr.*, 117(4), (2017): 490-499.

As people age, many don't want to eat meats because meats are more challenging to chew or because they think meat is more difficult to digest. But maybe it's because they've lost all their teeth after consuming too much sugar for decades.

The fact is, as people age, they need more protein, not because their requirements are greater but because as the body ages, the body is less able to digest and absorb proteins. Also, older people are more likely to have poor gut health from decades of eating foods that are nutrient-poor and damaging to the gut lining.

At any age, you must heal your gut because too much protein and not enough digestion and absorption can cause muscle atrophy and wasting. Not enough protein can also cause swelling of the feet and ankles and even anemia. Most natural proteins come with fat. If you are absorbing sufficient protein, you should have sufficient fat ratios. But too often, people steer clear of fats, which results in fatty acid deficiencies.



The Importance of Fats

The brain is the most energy-demanding organ, and the brain needs fat for survival. The brain is more fat than any other macronutrient—about 60% fat.

The powerhouse of cells is the mitochondria, which convert what we eat into energy. Ketones are an energy source derived from fat. The mitochondria prefer fat as energy (ketones) because turning ketones into energy costs the mitochondria half the effort of using sugar (glucose) for energy.[188]

Is it any wonder that when our bodies are used to running on glucose for energy but that form of energy starts to lose its efficacy—becoming insulin resistant—everything in the body starts to break down? The cell's powerhouse for making energy (the mitochondria) no longer has the fuel to make sustainable energy. Without energy, things die. Maybe we have to start leaning on a different fuel source than sugar.

The brain needs fat-soluble vitamins and cholesterol for cognitive function, memory, and proper nerve function. Most individuals fuel the brain with glucose from carbohydrates, but their long-term effects are damaging to the body. Yes, this runs counter to everything you thought you knew about nutrition. If you want to know why this happened, read Nina Teicholz's *The Big Fat Surprise*.

All the cell walls in the body are made up of fatty acids. The better the quality of the fats, the stronger the cell walls are for bringing in nutrients and removing waste. What goes out of the body (energy and cell waste) can be only as good as what the body takes in (food).

Because every cell structure is made of fatty acids, fats essentially control everything. If you don't have the right fats, you don't have properly functioning cells. Function starts at the cellular level. If you eat highly processed carbohydrate foods made of inflammatory oils and processed sugars, that's what your body has to work with for function. How can the body function properly if it is on a diet of processed, nutrient-poor foods? If you continuously put diesel in a car that requires unleaded fuel, what do you think will happen?

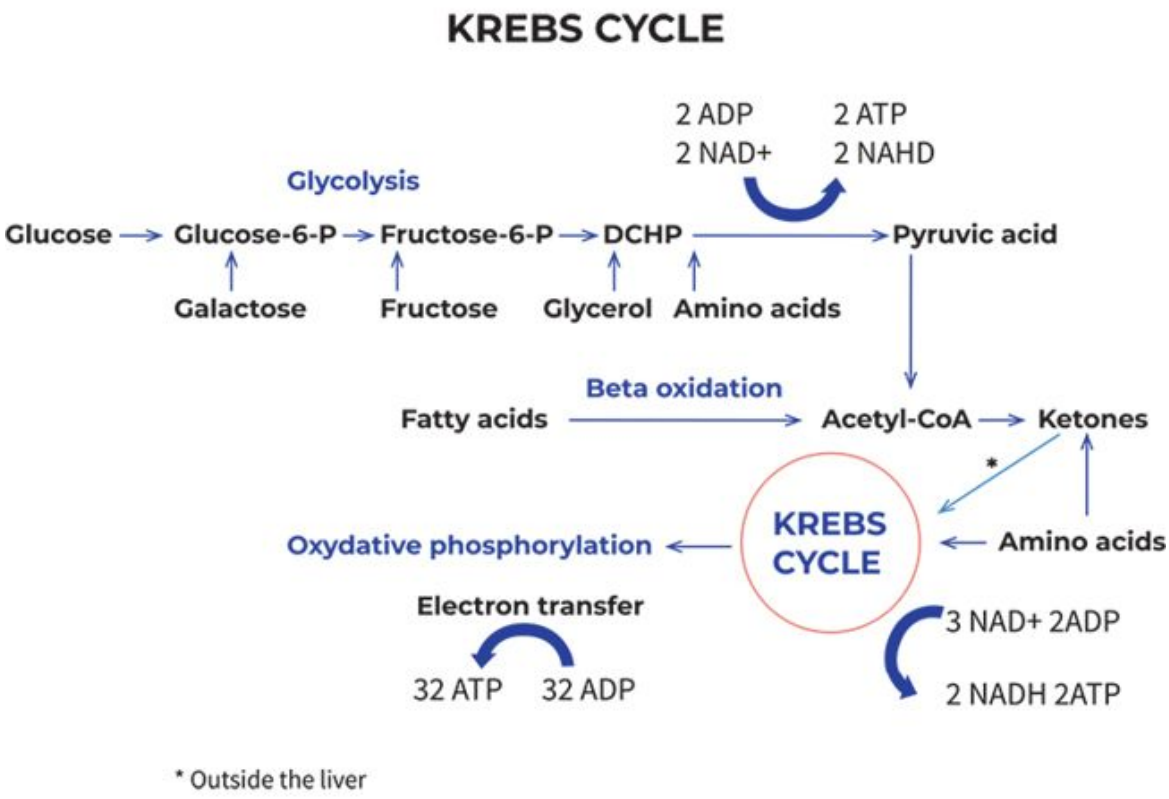


Figure 8.7. Krebs Cycle.

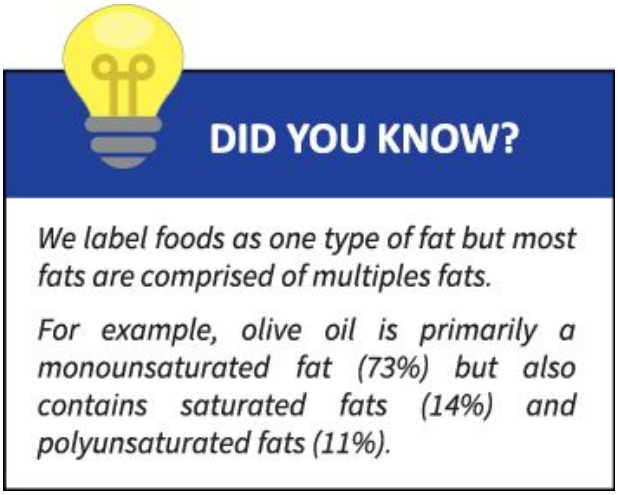
Figure 8.7 shows the Krebs cycle, where our cells make energy. Don't worry about all the details. Just note how many steps are needed to break sugar molecules down into energy. Then compare that process with the number of steps it takes to turn fat into energy. Fat is easier to use for energy.

When we run on ketones and rely on our body's stored energy or energy from fat, the body has more clean-burning and long-lasting energy to draw on. This is why eating high fat, and low carbohydrate diets make us feel less hungry.

Not All Fats Are Created Equal

Healthy good fats are essential for heart health, hormone production, brain function, tissue development, appetite control, and fat-soluble vitamins A, D, E, and K.

There are saturated fats (butter), polyunsaturated fats (salmon), monounsaturated fats (olive oil), vegetable oils (canola oil), and hydrogenated vegetable oils (trans fats like soybean and vegetable oil). Hydrogenating vegetable oils—this is how they become solid (margarine)—turns them into trans fats.



Remember, the digestion of fat requires bile from the gallbladder or liver to mix and emulsify dietary fats for absorption by the body. Usually, a sign of malabsorption and not enough bile is having runny or oily stools after consuming a fat-rich meal.

The Good Fats

Saturated fats supply the body with clean energy and provide tremendous benefits for those on a low-carbohydrate diet. Beef, whole milk, animal fats, and coconut oil are sources of saturated fats. Table 8.8 lists different kinds of animal fats.

ANIMAL FAT VARIETY

You can buy raw fat from local farmers or in the freezer sections at grocery stores. Trust your source and buy the highest quality fats as most toxins are stored in fat tissue.

FATS	ABOUT	PREPARATION	FAT COMPOSITION
Chicken fat (Shmaltz)	• Chicken fat (Shmaltz) is usually sold rendered and should be a pale to medium yellow color. • Since it contains more poly-unsaturated fat than other animal fats, it is barely solid at room temperature.	It has a lighter flavor than duck fat and used in chicken stocks and other chicken dishes. It adds even more chicken flavor and depth to recipes.	• Saturated fat: 30% • Monounsaturated fat: 45% • Polyunsaturated fat: 21%
Duck fat	• Raw fat comes with the duck and should be white, yellow, or pink. • Rendered fat (most common in stores) is solid but soft at room temperature. It should be creamy white and have the consistency of butter.	You can make a confit with duck fat as duck fat is the most decadent.	• Saturated fat: 33% • Monounsaturated fat: 49% • Polyunsaturated fat: 13%
Pig fat (Lard)	• Raw fat from a pig will be white to pale pink. It can include meat, skin and even connective tissue. • Rendered fat from a pig should be pure white to a pale cream color. It's a soft solid at room temperature with a similar consistency to butter.	Lard can be used in any dish in replace of butter. It can also be added to pork dishes for added pork flavor and depth.	• Saturated fat: 39% • Monounsaturated fat: 45% • Polyunsaturated fat: 11%
Beef fat (Suet or Tallow)	• Raw fat from a cow is called suet and should be white to pale yellow, pink, crumbly and light. Suet is also known as the fat around the organs such as the kidneys. • On muscle meats, grain-fed cows have more of a white hue whereas grass-fed cows have more of a yellow hue. • Rendered fat from a cow is called tallow and should be white to cream colored. Because of it's high saturated fat content, it's hard and brittle at room temperature.	Tallow is one of the most stable (high-heat) cooking fats because of the saturated fat content and low polyunsaturated fat content. Tallow has a mild beef flavor and great to cook with eggs and other pan fried foods.	• Saturated fat: 39% • Monounsaturated fat: 45% • Polyunsaturated fat: 11%

Table 8.8. Animal Fat Variety.

ROLE OF SATURATED FATS	
Cell membranes	• Saturated fatty acids make up to 50% of cell membranes
Bones	• Helps the body put calcium in the bones
Liver	• Protect the liver from alcohol and other toxins
Lungs	• Cannot function without saturated fats
Kidneys	• Cannot function without saturated fats
Immune system	• Enhance immune system
Essential fatty acids	• Work together with saturated fats
Detoxification	• Supports body's detox mechanisms

Table 8.9. Role of Saturated Fats.

ANIMAL FAT SMOKE POINTS	
• Bacon fat	• 325°F
• Chicken fat	• 325°F
• Duck fat	• 325°F
• Goose fat	• 325°F
• Lard (Cow fat)	• 374°F
• Ghee (Clarified butter)	• 482°F

To give you an idea of what these temperatures look like, set your burner on medium-heat and after about 5-10 minutes, the oil will reach about 350 degrees.

Another way to check is by having your hand 2 inches above the pan. When the temperature of the pan at medium is about 325-400°F, you will have to move your hand after 3 seconds.

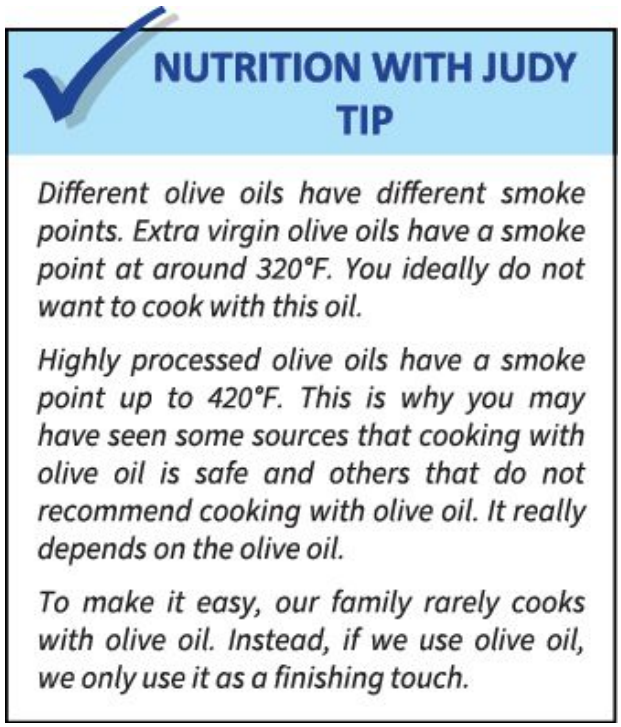
Table 8.10. Animal Fat Smoke Points.

Polyunsaturated fats (like omega-3s) are vital for the cell membrane structure and for the cells to communicate. Omega-3s are essential for eye and brain development. Omega-3s help the cells of the entire body to work together and be healthy. Polyunsaturated fats are typically present in foods dense with micronutrients. For example, salmon, albacore tuna, and trout are high in polyunsaturated fats, as are walnuts and sunflower seeds.

Monounsaturated fats may improve cholesterol levels and may lower LDL cholesterol. Monounsaturated fats also help to maintain cells but often go rancid with heat, light, and oxygen. The ideal way to store oils is in the refrigerator and only keep out the amount (in a dark, glass container in a dark, cool space) you will use for the week. Avocado and olive oil are good sources of monounsaturated fats.

The smoke point is when an oil or fat will burn and start releasing toxic fumes and free radicals that are very harmful to the body. You will notice gaseous vapors, a marker that the oil has passed its

smoke point and is decomposing. When an oil decomposes, it chemically changes the oil's structure and changes the food's flavor and nutritional value. It also creates carcinogenic compounds that are incredibly harmful when consumes or inhaled. Remember, oxidation equals inflammation.



The Bad Fats

Vegetable oils, like canola, soybean, and corn, release toxic chemicals linked to cancer and disease. Vegetable oils are highly processed and cause inflammation. These oils also can damage and alter healthy cells. Vegetable oils are in processed foods that are often also high in carbohydrates—a deadly combination.

Most oil oxidizes in a bottle (even olive oil, avocado oil, and coconut oil). While olive oil, avocado oil, and coconut oil have higher smoke points (avocado oil at 520 degrees Fahrenheit), they can still oxidize.

Canola Oil

Canola is considered one of the safest oils by the standard American diet. Canola oil consumption has been linked to vitamin E deficiency and respiratory disease.[189]

Canola oil is extracted from the rapeseed plant that is bred to have lower levels of erucic acid. Rapeseed oil causes heart damage in animal studies. While the new name of rapeseed is canola, it still contains trace amounts of toxic erucic acid (up to 2 percent is considered safe). In 1995, genetically modified foods were introduced to rapeseed, and almost all canola crops in North America are now genetically modified. You already know how toxic genetically modified foods are to the bacteria in the body. The process of deodorizing canola oil to make the oil palatable, transforms omega-3s into trans fats. These trans fats are not labeled.[190]

Expeller pressed is when the plant seeds are crushed and heated. Sixty-five to 70 percent of the oil is yielded. The remaining oil is pulled out using chemical solvents like hexane. Hexane is poisonous, and manufacturers assure consumers that all hexane is removed. While the expeller process is better than hexane canola, the expeller pressing process can cause enough heat for the oil to rancidfy. Some companies will cold press their oils (80-120 degrees Fahrenheit), but the practice isn't regulated in the United States, so I'd question any U.S. cold-pressed labels.[191]

The heating process of canola causes the oils to become unstable and prone to oxidation. These free radicals then cause chronic low-grade inflammation in the body. And it is inflammation in the body that is the root of all modern disease. Canola oil is also the jack of many trades. It is a pesticide used to smother insects, as an industrial lubricant and used as biofuel. It's also used to make plastics, cosmetics, and printing inks. Yes, we consume this same oil

and is recommended for consumption by the World Health Organization.

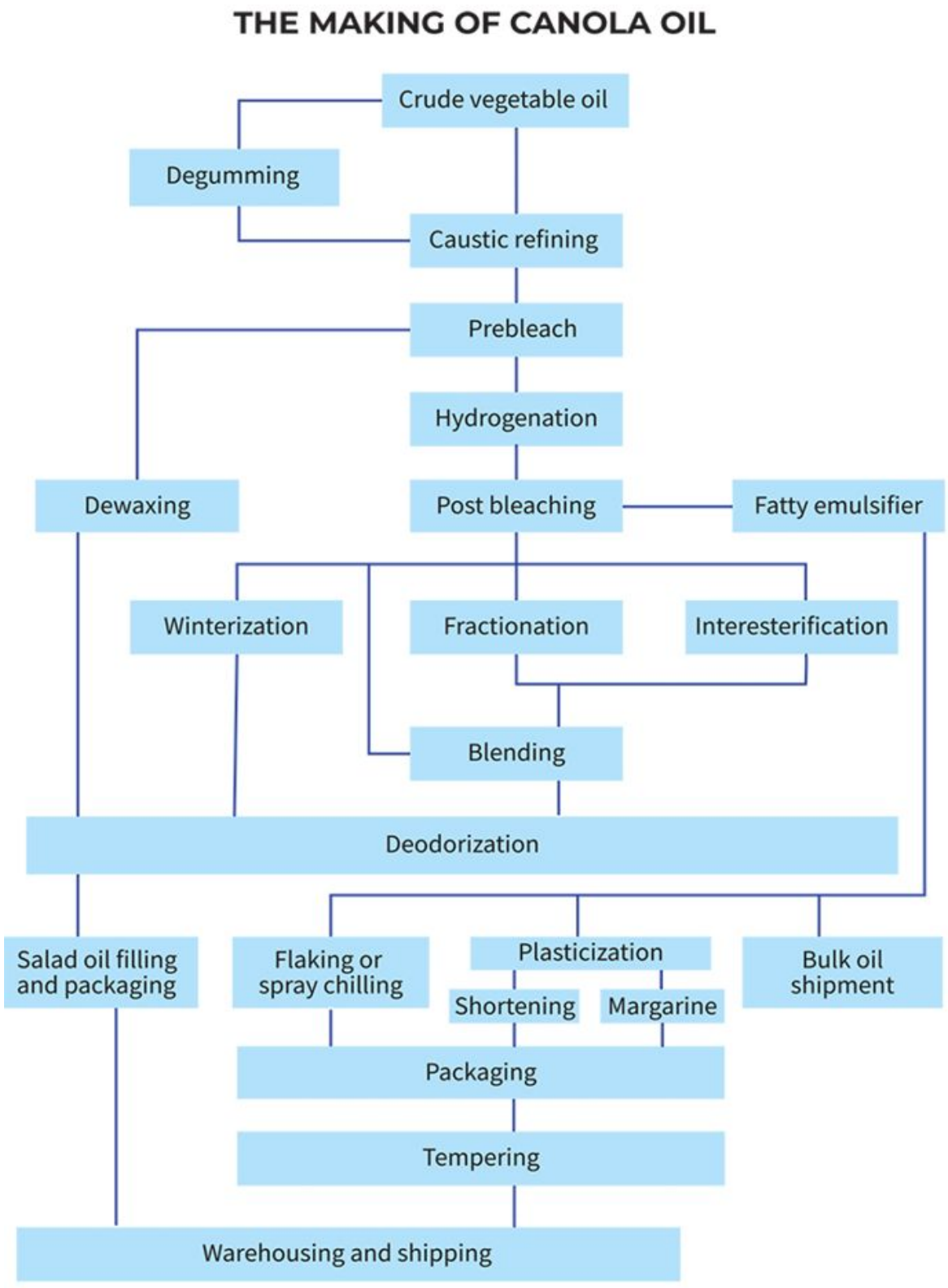
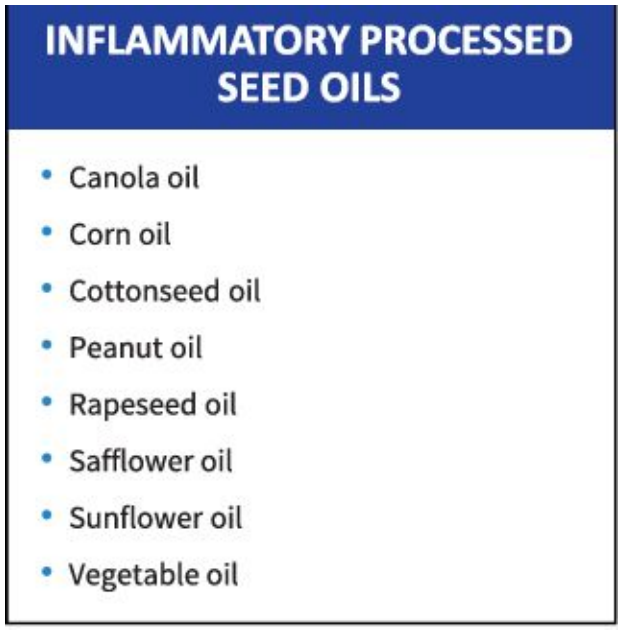


Figure 8.11. The Making of Canola Oil.

Hydrogenated vegetable oils (trans fats) raise not only LDL cholesterol but also lower HDL, thereby doubling the risk of heart disease. Trans fats also increase another heart disease marker called Lp(a) and can increase blood clotting and inflammation, increasing the risk of heart attack or stroke. Trans fats are common in processed foods, fast food, and margarine.



Stay away from all vegetable oils. Use animal fats that are nutrient-dense and in their natural form. If you choose plant-based oils, then olive oil might be your best option. Avocado oil is another option with its high smoke point, but it does have histamines and is considered a medium-high food on the FODMAP diet. Never buy olive oil blends. It usually means the olive oil is added to a vegetable oil. This includes olive oil mayonnaise. Always check the ingredients.

I have a list of oils to use while cooking and graphics with their smoke points. You can download the guide at www.carnivorecure.com/nutrition.

Fat for Children

Children require approximately 35 to 40 different micronutrients for normal function. Maximizing nutrient density should be the primary goal when choosing foods, especially for our children.

At about one year, a baby's diet shifts because the growth rate slows down compared to the first year. Although a child's growth slows down around the age of two, the brain continues to grow and develop rapidly. In the first year, a child's brain doubles in size and is 90 percent developed by 5. The brain keeps growing to about 80 percent of adult size by age three and 90 percent by age five.

Yes, the brain is almost fully grown by age five.

There is a short window to focus on our children's nutrition. How many kids eat nutrient-dense foods at age five? We usually feed them chicken nuggets and peanut butter and jelly sandwiches. Five years of optimal nutrition can change their lives forever. Sadly, the results go both ways.[192]

I have a more detailed guide on feeding our kids the nutrient-dense way and the optimal first foods for babies, pregnancies and breastfeeding moms. You can get it at www.carnivorecure.com/nutrition.

The brain weighs only about three pounds but has over 25 percent of the total cholesterol in the body. Remember, the brain is about 60 percent fat. What if the statins—cholesterol-lowering medicines—are lowering the cholesterol for the brain?

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185 Schaafsma, "Protein Digestibility–Corrected Amino Acid Score," 1865S-1867S.

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188 Puchalska and Crawford, "Multi-Dimensional Roles … Therapeutics," 262–84.

189 U.S. FDA, “CFR - Code of Federal Regulations Title 21: Subpart B -- Listing of Specific Substances Affirmed as GRAS.” www.accessdata.fda.gov, 2019. ”
190 O’Keefe, “Levels of Trans Geometrical Isomers,” 165–76.
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Chapter 9

Hello Meat: The Nutritional Value of Meat

Facts do not cease to exist because they are ignored.

—Aldous Huxley

We don't have to go far back in history to see the prevalence of animal-based diets. Historically, all indigenous peoples ate a primarily animal-based diet, and many do today.

- Brazilian gauchos ate primarily beef.
- The Chukchi of the Russian Arctic ate caribou meat, marine animals, and fish.
- Inuit of the Canadian Arctic thrived on fish, seal, walrus, and whale meat.
- Masai, Samburu, and Rendille warriors of East Africa ate meat and milk primarily.
- Steppe nomads of Mongolia ate meat and dairy.
- The Sioux of South Dakota ate buffalo meat.

NUTRIENTS INADEQUATE OR MISSING IN PLANT-BASED FOODS

There are nutrients that are either difficult or impossible to get in sufficient amounts from plant-based foods. A diet that requires exogenous supplementation may not be a diet for optimal health.

NUTRIENT	FDA DAILY VALUES	RICH FOOD SOURCES	RISKS AND SIGNS OF DEFICIENCY
Vitamin B12	• 2.4 mcg	• Dairy • Eggs • Fish • Meat	• Anemia • Fatigue, weakness • Impaired brain function • Neurological disorders • Neurological disorders in breastfed babies • Possible link to Alzheimer's disease • Possible link to heart disease • Psychiatric disorders
Carnosine (Antioxidant)	• varies	• Fish • Meat	• Cardiovascular disease • Fatigue • Hypoglycemia • Muscle weakness
Creatine	• varies	• Fish • Meat	• Fatigue • Impaired brain function, including memory • Impaired physical performance • Muscle weakness
Vitamin D3 (Cholecalciferol)	• 20 mcg	• Cod liver oil • Fish • Egg yolks • (Outdoor Sun)	• Cancer • Depression • Heart disease • Impaired brain function • Muscle wasting and reduced strength • Multiple sclerosis • Osteoporosis
DHA (Docosahexaenoic) (an essential Omega-3 fatty acid)	• Varies (220 mg)	• Anchovies • Cod liver oil • Egg yolks • Fish oil • Mackerel • Salmon • Sardines	• Impaired brain function • Impaired mental health • Inadequate DHA in pregnant women may adversely affect fetal brain development • Psychiatric disorders *Note:* This is why incorporating fish or egg yolks is optimal on a carnivore diet
Heme iron	• 18 mg	• Red meat • Pork • Poultry • Fish (less)	• Brittle nails and hair loss • Difficulty focusing • Dizziness and headaches • Fatigue and overall weakness • Low mood (apathy) • Pale skin • Shortness of breath • Sore muscles and restless leg syndrome
Taurine (Antioxidant)	• varies	• Dairy • Eggs • Fish • Meat	• Anxiety or depression • Hypertension • Impaired muscle function • Impaired vision • Physical endurance and recovery issues • Weight gain

Table 9.1. Nutrients Inadequate or Missing in Plant-Based Foods.

Weston A. Price, a dentist and ethnographer who also founded the American Dental Association's research arm, found that people in the best health ate closest to the natural foods from the land. He found that as soon as populations were exposed to modern foods such as refined vegetable oils, sugar, and white flour, signs of health decline came very quickly. Within the same generation, siblings would show a difference in dental caries, crooked teeth, deformed jaw structures, arthritis, and lower immunity to tuberculosis.[193]

Traditional societies ate few vegetables and grains because trying plants was like playing a bit of Russian roulette: some plants are poisonous, and the only way to know was to try them. I would have hated to be the person testing raw red kidney beans. Animal foods such as butter, fish, eggs, organ meats, and shellfish provided traditional societies with at least four times the calcium and other minerals and ten times the fat-soluble vitamins than plant-based foods.[194]

Francis Pottenger's Cat Studies

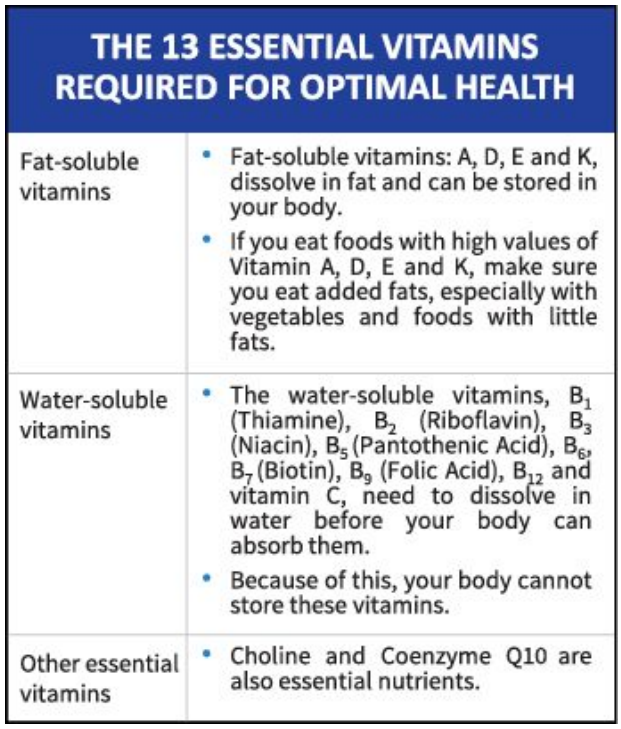
In another set of studies, Dr. Francis Pottenger, a physician who founded the Pottenger Sanatorium for tuberculosis, conducted life expectancy tests on cats between 1932 and 1942.

He studied over 900 cats over ten years and found that nutrient-poor foods, including pasteurized low-fat milk, eventually degraded cats to death within four generations. The cats, over time, suffered from mental health disorders, hypothyroidism, and other modern diseases.[195]

These cat studies show that disease does not end with one generation. Our children are only as healthy as we are.

Meat and the Recommended Daily Allowance

The Food and Nutrition Board of the National Research Council and the National Academy of Sciences determine the recommended dietary allowances (RDA) for proper nutrition. About thirty vitamins and minerals are essential for the human body to have optimal health. Remember, these nutrients are considered essential because the human body does not make them, but needs them. You must obtain them from foods or supplements.



THE 13 ESSENTIAL VITAMINS REQUIRED FOR OPTIMAL HEALTH	
Fat-soluble vitamins	• Fat-soluble vitamins: A, D, E and K, dissolve in fat and can be stored in your body. • If you eat foods with high values of Vitamin A, D, E and K, make sure you eat added fats, especially with vegetables and foods with little fats.
Water-soluble vitamins	• The water-soluble vitamins, B_1 (Thiamine), B_2 (Riboflavin), B_3 (Niacin), B_5 (Pantothenic Acid), B_6, B_7 (Biotin), B_9 (Folic Acid), B_{12} and vitamin C, need to dissolve in water before your body can absorb them. • Because of this, your body cannot store these vitamins.
Other essential vitamins	• Choline and Coenzyme Q10 are also essential nutrients.

Vitamin is derived from the Latin *vita*, meaning life. Vitamins are essential organic molecules needed in small amounts for normal function, growth, and maintenance of body tissues. Vitamins can be broken down into fat-soluble vitamins and water-soluble vitamins.

There are seven macrominerals and thirteen trace minerals that make up the 20 essential minerals list. Minerals are inorganic elements (members of the Periodic Table of Elements) that require an essential nutrient other than the following:

- Carbon

- Hydrogen
- Nitrogen
- Oxygen
- Sulfur

These form the backbone of most organic molecules including amino acids (protein), fatty acids (fats), and vitamins.

What do you need to eat to hit the daily recommended allowance of vitamins and minerals?

THE 20 ESSENTIAL MINERALS REQUIRED FOR OPTIMAL HEALTH	
7 Macro minerals	The 20 essential minerals are broken down into 7 essential macro minerals, defined as such, since we require more than 100 mg per day. • Calcium • Chloride • Magnesium • Phosphorous • Potassium • Sodium • Sulfur
13 Trace minerals	The following minerals are considered trace minerals because only trace amounts are required, usually between 1-100 mg per day. These trace minerals are not just nice-to-haves. Just because they are required in small amounts, does not trivialize the body's mandatory requirements for them. Make sure to eat foods with these trace minerals, because a little goes a long way. • Boron • Chromium • Cobalt • Copper • Iodine • Iron • Manganese • Molybdenum • Nickel • Selenium • Silicon • Vanadium • Zinc

Table 9.3 lists the most nutrient-dense foods. Eat these foods for optimal health and nutrition.

If you eat only these foods, you will be more than just fine. What are the individual vitamins and minerals that make up each superfood? Let's take a closer look.

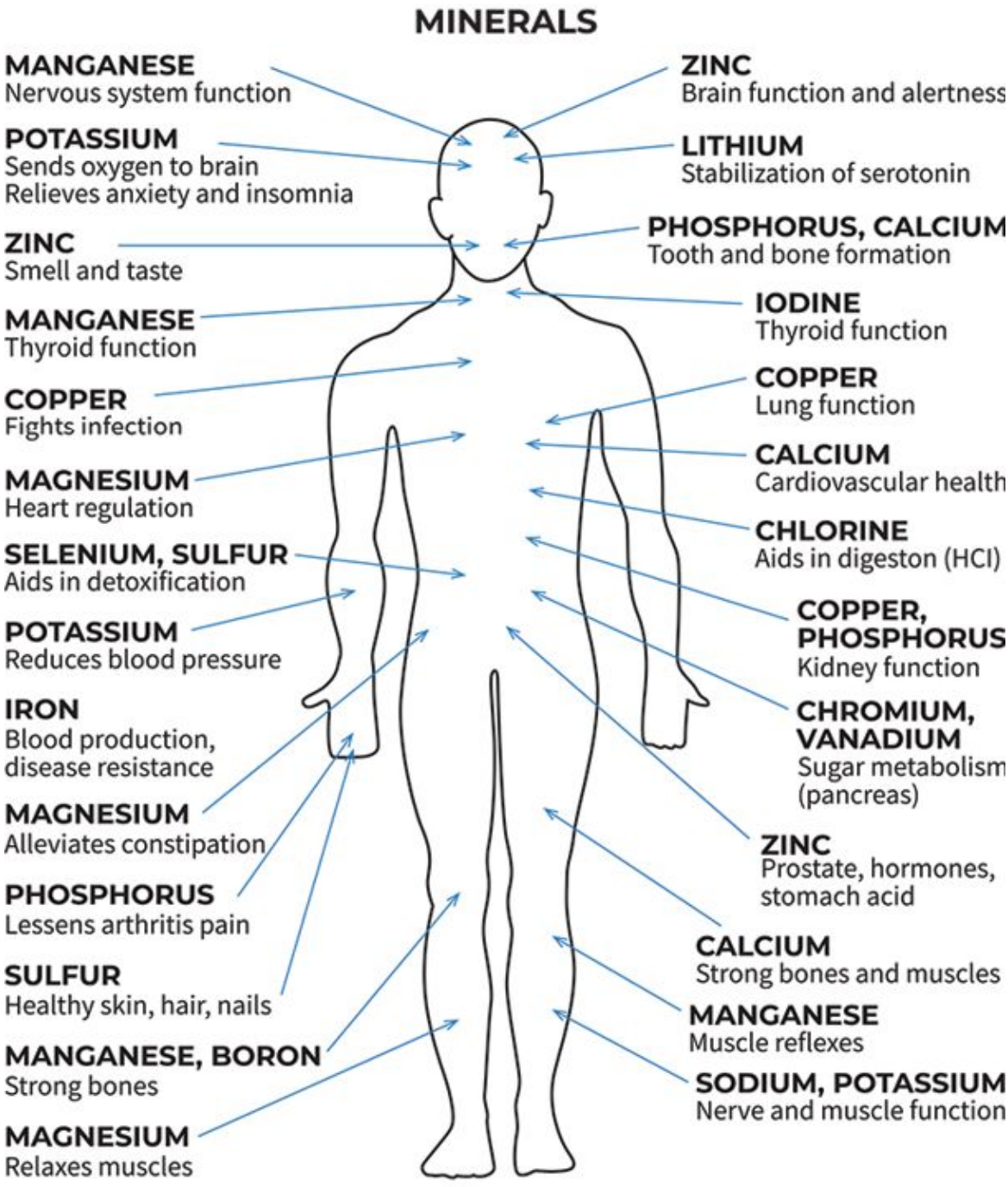


Figure 9.2. Minerals.

MOST NUTRIENT-DENSE FOODS

	13 ESSENTIAL VITAMINS	COUNT	20 ESSENTIAL MINERALS	COUNT
SALMON ROE	A, B_1, B_2, B_3 (Niacin), B_5, B_6, B_7 (Biotin), B_9 (Folate), B_{12}, C, D, E, K_2, (Choline, CoQ10 varies)	13+	Calcium, Chromium, Cobalt, Copper, Iodine, Iron, Magnesium, Manganese, Molybdenum, Nickel, Phosphorous, Potassium, Selenium, Silicon, Sodium, Zinc	16
FISH/ SALMON	A, B_1, B_2, B_3, B_5, B_6, B_7, B_9, B_{12}, C, D, E, K_2, (Choline, CoQ10 varies per fish)	13+	Calcium, Chromium, Cobalt, Copper, Iodine, Iron, Magnesium, Manganese, Molybdenum, Nickel, Phosphorous, Potassium, Selenium, Silicon, Sodium, Zinc	16
BEEF LIVER	A, B_1, B_2, B_3, B_5, B_6, B_7, B_9, B_{12}, C, D, E, K, (Choline)	13+	Calcium, Chromium, Cobalt, Copper, Iron, Magnesium, Manganese, Molybdenum, Phosphorous, Potassium, Selenium, Sodium, Zinc	13
CHICKEN	A, B_1, B_2, B_3, B_5, B_6, B_7, B_9, B_{12}, C, D, E, K, (Choline)	13+	Calcium, Copper, Chromium, Cobalt, Iron, Magnesium, Manganese, Molybdenum, Phosphorous, Potassium, Selenium, Sodium, Zinc	13
SHELLFISH	A, B_1, B_2, B_3, B_5, B_6, B_7, B_9, B_{12}, C, D (varies), E, K, (Choline, CoQ10)	13+	Calcium, Chromium, Cobalt, Copper, Iodine, Iron, Magnesium, Manganese, Phosphorous, Potassium, Selenium, Sodium, Zinc	13
GRASS-FED BUTTER	A, B_1, B_2, B_3, B_5, B_7, B_9, B_{12}, D, E, K, (Choline, CoQ10)	12+	Calcium, Chromium, Cobalt, Copper, (Trace, Varies), Iodine, Iron, Magnesium, Molybdenum, Phosphorous, Potassium, Selenium, Sodium, Zinc	13
LAMB CHOPS	A, B_1, B_2, B_3, B_5, B_6, B_7, B_9, B_{12}, D, E, K, (Choline)	12+	Calcium, Copper, Iron, Magnesium, Manganese, Molybdenum, Phosphorous, Potassium, Selenium, Sodium, Zinc	11
RIBEYE	A, B_1, B_2, B_3, B_5, B_6, B_9, B_{12}, D, E, K, (Choline, CoQ10)	11+	Calcium, Chromium, Cobalt, Copper, Iron, Magnesium, Manganese, Molybdenum, Phosphorous, Potassium, Selenium, Sodium, Zinc	13
CHICKEN EGGS	A, B_1, B_2, B_3, B_5, B_6, B_7, B_9, B_{12}, D, E, K, (Choline, CoQ10)	11+	Calcium, Chromium, Cobalt, Copper, Iodine, Iron, Magnesium, Manganese, Molybdenum, Phosphorous, Potassium, Selenium, Zinc	13
PORK BELLY	A, B_1, B_2, B_3, B_5, B_6, B_9, B_{12}, C, D, E, (Choline)	11+	Calcium, Copper, Iron, Magnesium, Manganese , Phosphorous, Potassium, Selenium, Sodium, Zinc	10
DAIRY	A, B_1, B_2, B_3, B_5, B_6, B_{12}, D, E, K	10	Calcium, Chromium, Cobalt, Copper (Cheese), Iodine, Iron, Magnesium, Manganese, Molybdenum, Phosphorous, Potassium, Selenium, Sodium, Zinc	14
BONE BROTH	A, B_3, B_5, B_6, B_{12}, C, D, K, (CoQ10)	8+	Boron, Calcium, Chloride, Chromium, Cobalt, Copper, Iodine (fish bones), Iron, Magnesium, Manganese, Phosphorous, Potassium, Silicon, Sodium, Zinc	15

13 vitamins & 20 minerals are considered essential because our bodies can't make them but they're required for best health. Some consider Choline, CoQ10 as additional essential vitamins. These nutrients are denoted as "+"

Table 9.3. Most Nutrient-Dense Foods.

Before I get into the nutritional profiles of foods, I want to clarify that all of the nutrition facts are conventional meats—meaning they are

grain-fed meats and farmed fish. Organic meats and wild fish are touted for their nutrient density. But they are sometimes inaccessible and often unaffordable for many people. By sharing figures that show conventional meats, you get to see the real power of nutrient-dense meats, regardless of whether they are organic or pasture-raised. If you are wondering about the organic variety, per the USDA's food nutrient database, the results are mixed. Sometimes the farmed variety has more nutrition than the wild versions, and sometimes the organic kinds have a small advantage. I'll discuss this more in Chapter 10. Also, keep in mind that while the USDA food nutrient database is considered the nutrition authority, the data is provided by the food manufacturers.

Lastly, all foods are depicted at 100-gram servings, which is only about 3.5 ounces. This is a small portion for any meat, but as 100 grams is the gold standard for all food comparisons, you can use these figures to compare any food's nutrient-density.

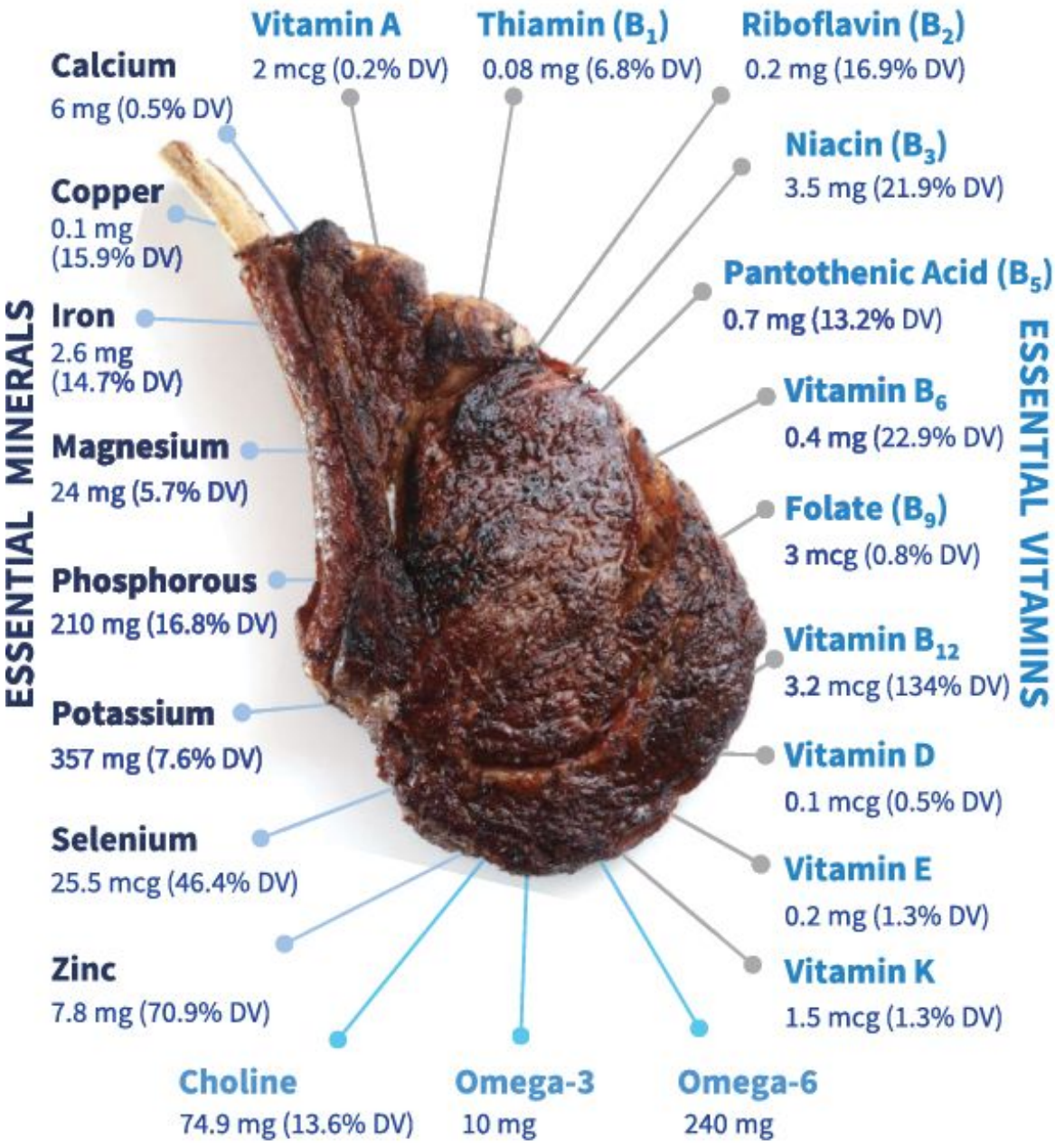
The Power of Beef

Most carnivore dieters prefer beef. Maybe it's because beef has more nutrients per ounce than chicken and pork. Beef also has a naturally perfect fat-to-protein ratio, and maybe why it's preferred over fish—even fatty salmon is lean compared to many beef cuts).

A ribeye steak has nearly all the essential minerals and vitamins the human body needs. Ribeye also has omega-3 and omega-6 fatty acids, as well as choline. All beef contains creatine and carnosine, which cannot be obtained from plant-based foods. Creatine plays a key role in energy regulation in the brain and muscles.

THE RIBEYE

per 100 gram serving
approx. 3.5 ounces



Per the USDA nutrition database, ribeye is missing Biotin (B_7) (dairy, liver, salmon, yolk), Chromium (eggs, fish, liver), Manganese (bone broth, egg), and Molybdenum (eggs, liver).

Figure 9.4. The Ribeye.

According to the USDA's food nutrient database, which provides nutrient profile information, ribeye is missing biotin (B7), but you can get healthy doses of it from dairy, liver, salmon, and egg yolks. Ribeye also lacks chromium, but it is available in egg yolks, fish, and liver. And the molybdenum missing from ribeye is found in egg yolks and liver.[196]

Eat ribeye with eggs, liver, and fish. You'll cover your daily value of vitamins and minerals.

The Power of Bone Broth and Bone Marrow

Little nutritional information is available about commercially sold bone marrow and bone broth. There are too many variables: ingredients, bone types, bone qualities, cooking time, and the animal's diet, to list a few.

It is estimated that a half-ounce serving or one tablespoon of beef marrow contains about 126 calories and 13.5 grams of total fat. One tablespoon of bone marrow has 13.5 grams of total fat (mostly monounsaturated fat). Bone marrow contains alkylglycerols (also found in shark liver oil), which have been found to be anticancer agents and can boost the immune system.

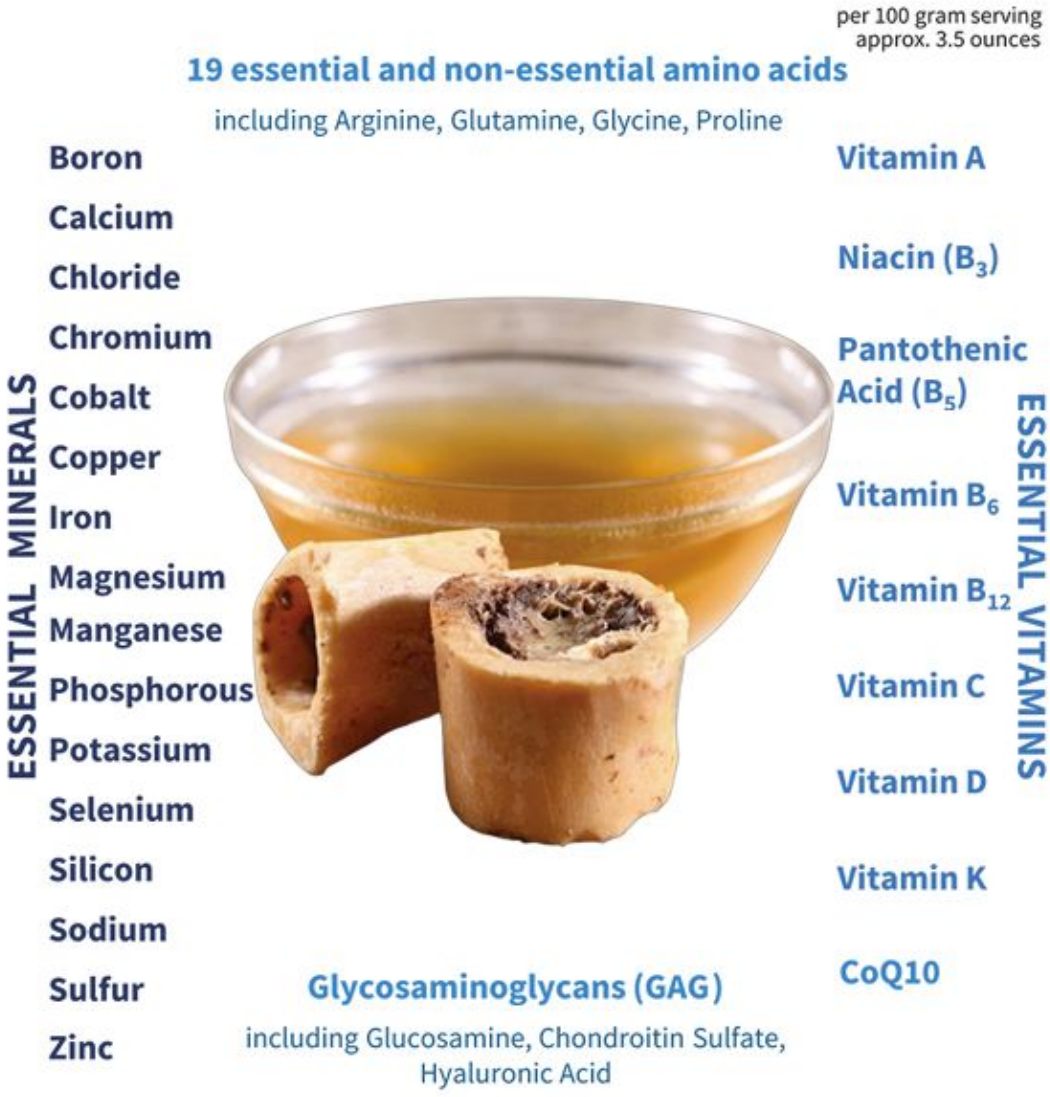
Bone broth is known for its collagen and gelatin. Collagen is vital for skin rejuvenation, strong bones, digestive and gut health, and connective tissue health. Osteoporosis, premature aging of the skin, and joint pain are among the unfortunate consequences of collagen deficiency. (Collagen and gelatin are similar but not the same. Gelatin results from boiling collagen-rich bones. Boiling makes the bones give up their collagen, minerals, electrolytes, and amino acids to create the consumable gelatin. The thicker the gelatin upon refrigeration, the more nutritional value it provides.)

If your broth isn’t gelatinous, it’s low in collagen and gelatin. Bone broth also has glycosaminoglycans that support elastin and collagen. They are shock absorbers and lubricants in the body. (People with compromised gut health often cannot tolerate glycosaminoglycans).

Remember, if you suffer from gut imbalances and excess oxalates in the body, you may want to limit your bone broth and stick to meat stock (muscle meats cooked for short periods).

Bone broth and bone marrow are touted for their mineral content, as boiling pulls the minerals from the bones. High-quality bone broths should contain most of the essential and nonessential amino acids, essential vitamins, and essential minerals.

BEEF BONE BROTH



Per the USDA nutrition database, little nutritional info is available for bone marrow and bone broth, as a whole. There are too many variables.

Note: Nutrition facts will vary dependent on bone contents and amount of water used. Estimates based on jointy bones (cow knuckles) & meaty bones (marrow) cooked in water.

Figure 9.5. Beef Bone Broth.

The Power of Lamb

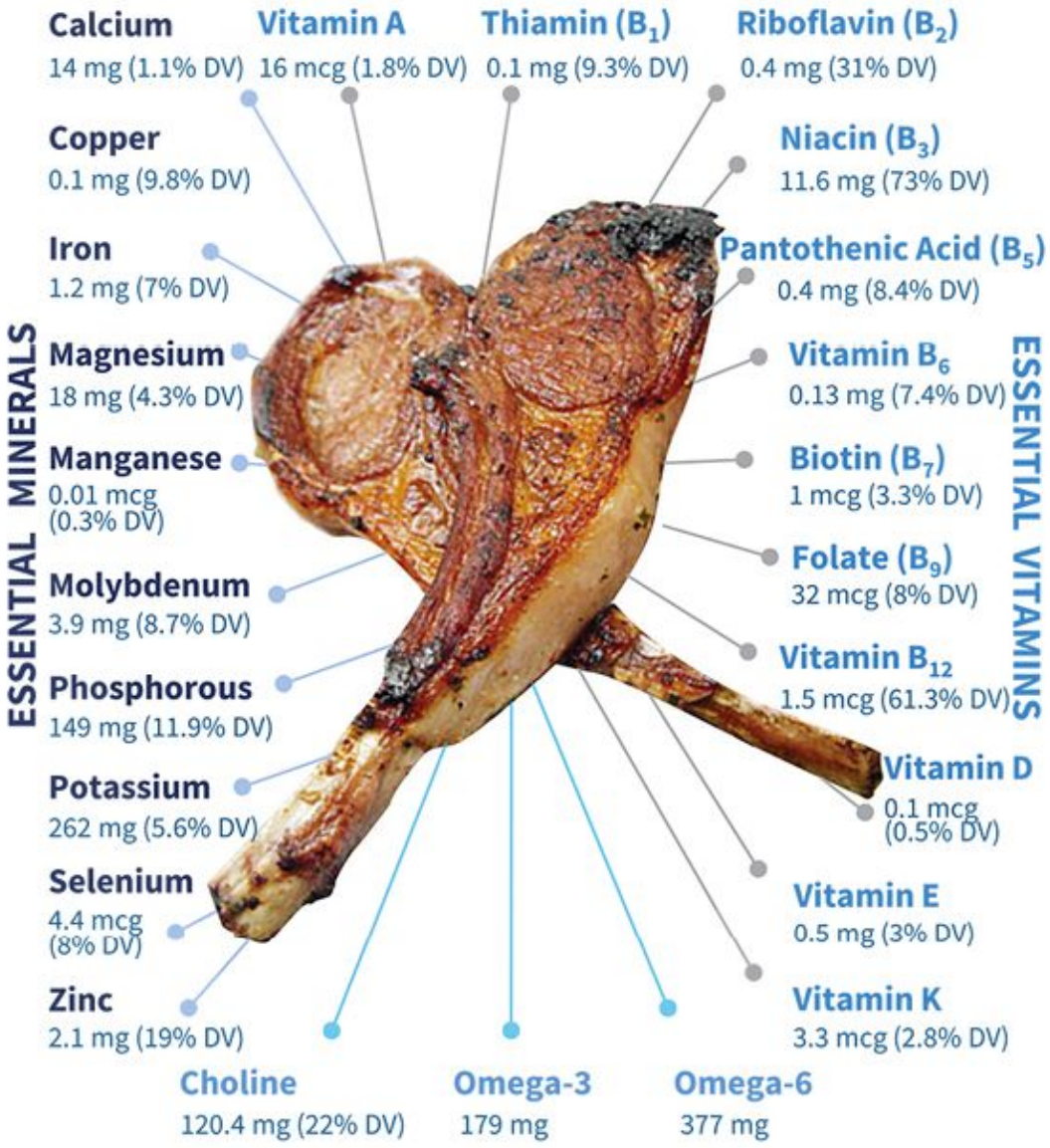
Compare a lamb rib chop and a ribeye, and you'll find they have nearly the same amount of nutrients. Lamb has more vitamin A than ribeye, and lamb has both biotin and molybdenum, essential minerals that the USDA has deemed missing from the ribeye steak.

Lamb contains fat, and a significant portion of that fat is omega-3s, the anti-inflammatory fatty acids. Most pieces of lamb contain more omega-3s than beef. An ounce of conventional lamb meat has the same number of calories as grass-fed beef but has more omega-3 fatty acids.

Lamb is an excellent source of vitamin B12, selenium, niacin (B3), phosphorous, and zinc. Selenium is an antioxidant that protects cells from oxidative stress and assists with disease prevention. Zinc is an essential trace mineral found in every cell of our bodies. Zinc plays a role in cell division, cell growth, and the breakdown of carbohydrates. It's necessary for growth and reproduction because zinc helps males produce testosterone. Zinc is also needed to make stomach acid. Zinc also supports the immune function, which is the main ingredient in the popular cold remedy Zicam, supporting wound healing. While zinc is a micronutrient, a little goes a long way.

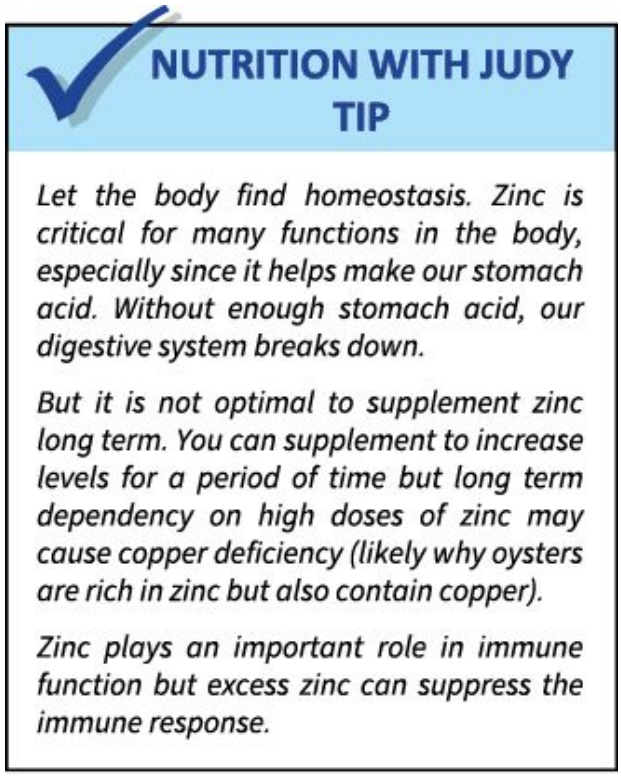
LAMB CHOPS

per 100 gram serving
approx. 3.5 ounces



Per the USDA nutrition database, ribeye is missing Biotin (B_7) (dairy, liver, salmon, yolk), Chromium (eggs, fish, liver), Manganese (bone broth, egg), and Molybdenum (eggs, liver).

Figure 9.6. Lamb Chops.



If you are concerned about a meat-only diet and consuming too many omega-6 fatty acids, then lamb is your meat, with its healthy doses of omega-3s. But if you eat a meat-only diet, you shouldn't have to worry about the amounts of omega-6s (because of inflammation) consumed.

The Power of Liver

Liver provides nature's most concentrated source of preformed vitamin A. It also contains abundant bioavailable B-complex vitamins, especially vitamin B12 and choline, biotin, iron, copper, zinc, and folate.

Fat-soluble vitamin A is from both preformed vitamin A (animals) and provitamin A (carotenoids in plants). Provitamin A requires conversion to retinol in order to be used by the body.[197] Provitamin A (plants) is far better absorbed in the presence of fat. If you plan to eat carrots, steam them and eat with butter or other healthy fats.

Even when eating carrots with fat, the provitamin A may never become retinol to be absorbed by the body.

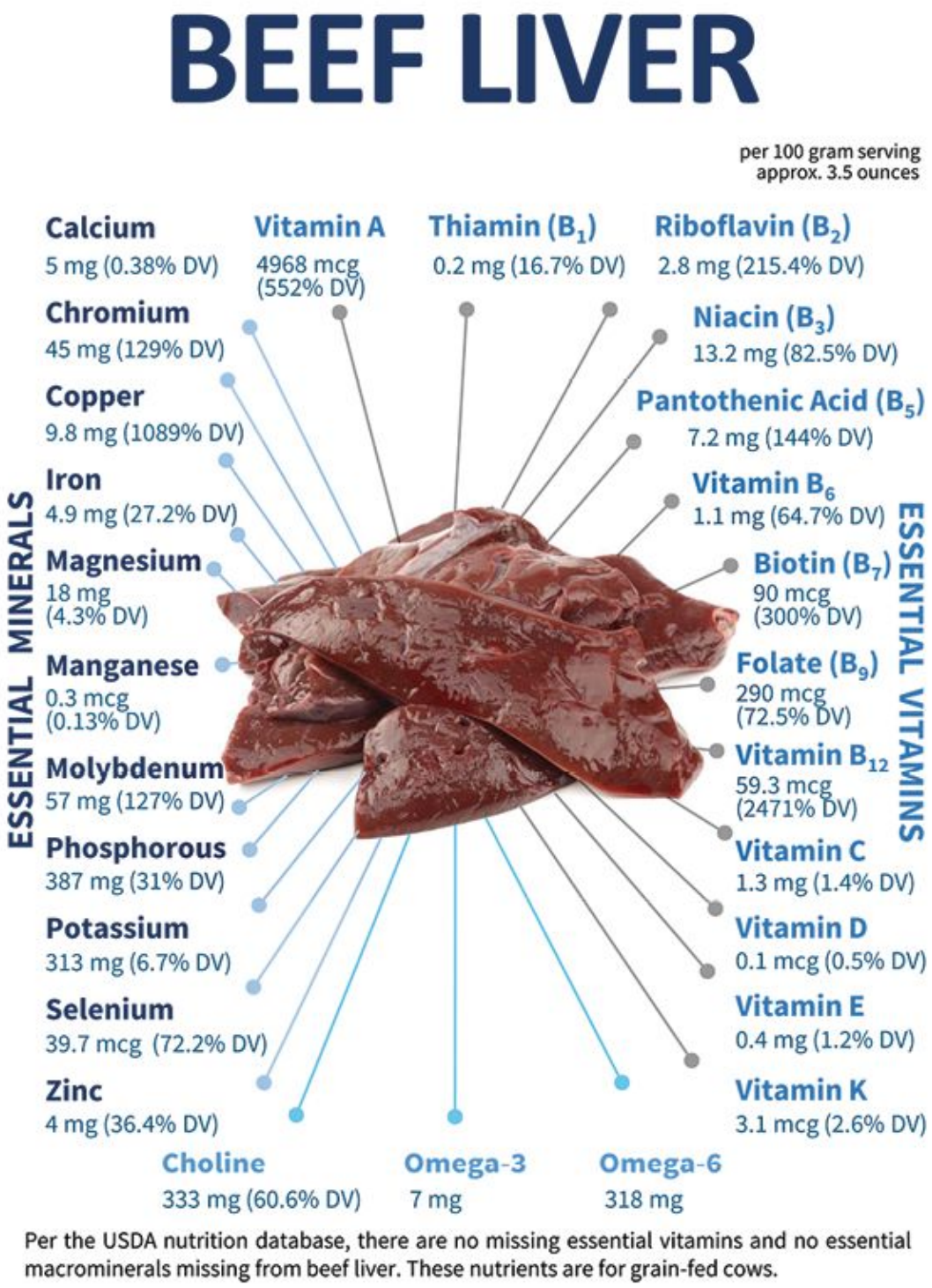


Figure 9.7. Beef Liver.

Vitamin A supports a healthy immune system, liver function, eye health, reproductive health, and genetic health. Skin conditions like

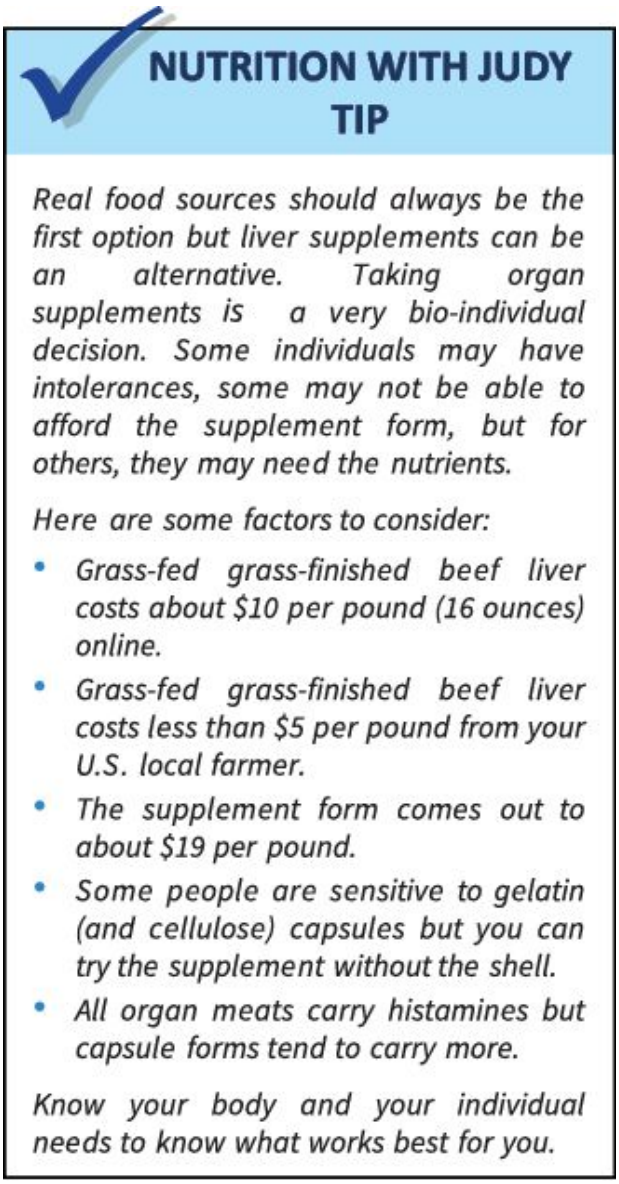
psoriasis and acne have been correlated with vitamin A deficiency.[198]

The nutrients that comprise liver are the building blocks of metabolic, immune, liver, skin, eye, reproductive, and mental health. These vital nutrients also tend to be deficient in our modern diet. The current recommendation for the amount of liver to eat in order to have good nutrition without courting vitamin A toxicity is about eight ounces per week.

Most people who eat a carnivore diet safely consume 16 to 32 ounces a week. Paleomedicina Hungary, a facility that manages patients with chronic internal disease using dietary intervention, recommends 16 ounces of liver and 8 ounces of bone marrow—consumed with a high-fat moderate-protein, animal-based diet, for therapeutic benefits.[199]

Liver is said to have an unidentified anti-fatigue factor. Studies done on rats have shown that something in the liver prevents them from becoming exhausted, now believed to be vitamin K2. Liver also provides CoQ10, a nutrient essential for cardiovascular function. CoQ10 is found in the highest concentration in the mitochondria because it helps produce energy.[200]

Some people cannot get past the mineral taste of beef liver. Chicken, goose, duck, and cod liver are much milder in flavor. Otherwise, supplementation with desiccated grass-fed liver is also an option. I always recommend a food-first approach, but do what works best for you, as any form of liver may be better than none.



The Power of Chicken Wings

Chicken wings are a good source of proteins and B vitamins and contain the same amount of monounsaturated fats like olive oil. Yes, olive oil and chicken wings have a similar fat composition.

Chicken wings have almost all the essential vitamins and minerals. Three and a half ounces (100 g) of chicken breast contain 33 percent of your daily need for vitamin B6 and 86 percent of the niacin you need every day. Niacin helps to build healthy skin and aids in digestion. Vitamin B6 helps metabolize protein and synthesize amino

acids. Dark chicken meat is richer in nutrients than white meat and contains much more iron and zinc than white meat.

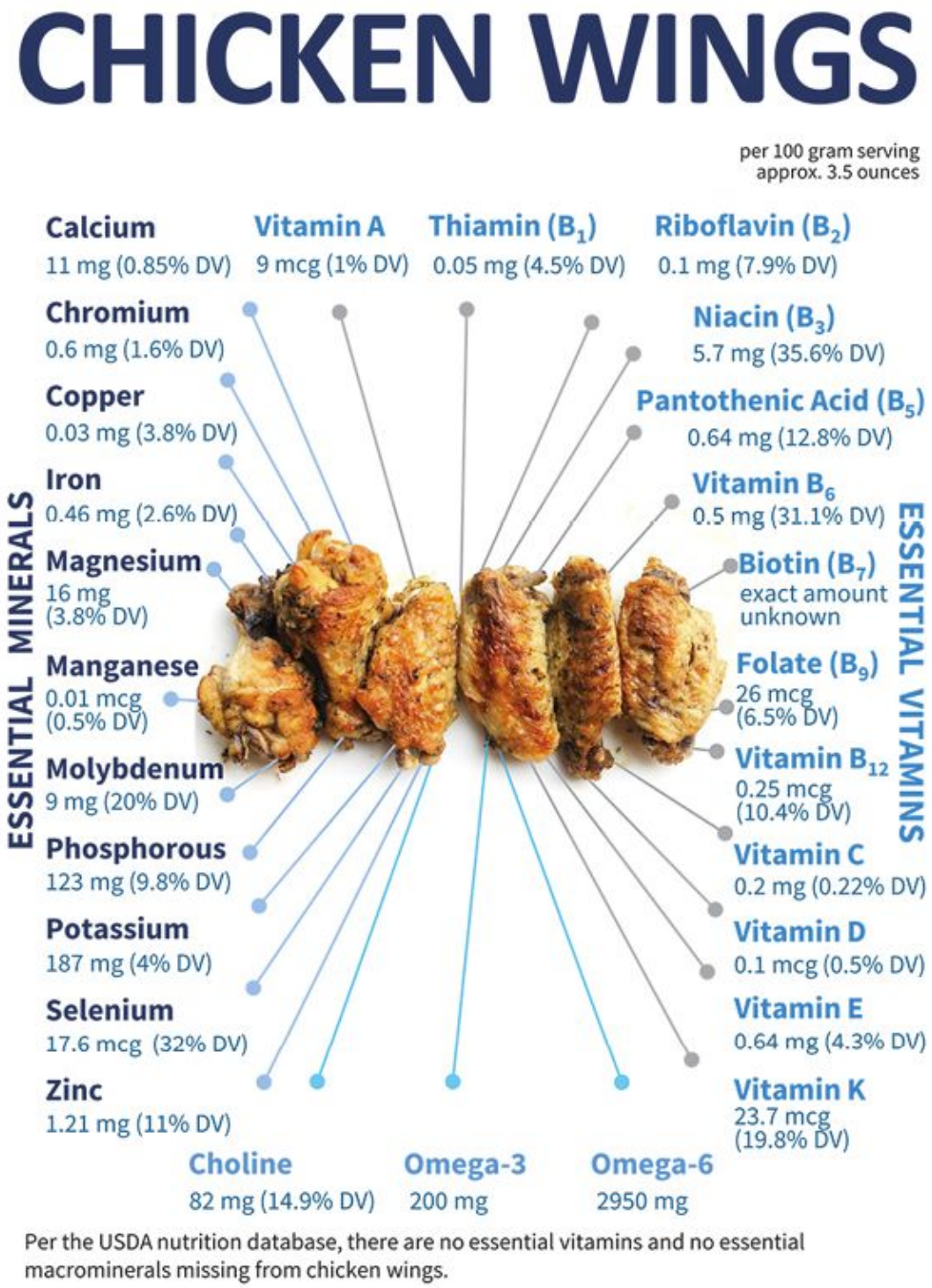


Figure 9.8. Chicken Wings.

Iron is critical, as iron deficiency is the most common nutritional deficiency in the world. The World Health Organization estimates

that nearly a third of the world's population may have low red blood cell numbers from insufficient iron.

In the United States, iron deficiency remains common, with 9 percent of toddlers (12 to 36 months) having inadequate iron stored in their bodies. Five percent of toddlers are anemic, and of those, 40 percent suffer from an iron deficiency, something that can be easily changed with the right foods.[201]

The Power of Pork Belly

Pork belly is not the same as bacon. Pork belly is uncured and unsmoked, whereas bacon is usually cured with salt (or often sugar) and other additives, smoked, and sliced.

Pork belly is the perfect food for a moderate protein diet high in fat. If you need extra fat during the day and would rather not drink oils, pork belly (and bone marrow) are good options. Pork belly is an excellent source of vitamin B12 and has a measurable amount of vitamin C.

Pork belly also contains more thiamin than ribeye or chicken wings. Thiamin, or vitamin B1, is one of the eight water-soluble B vitamins. Thiamin is required for the breakdown of fats and protein and helps maintain muscle tone in the digestive tract walls. Thiamin also supports the overall health of the nervous system, skin, hair, eyes, mouth, and liver. Thiamin also improves the body's ability to endure stress and has been called the antistress vitamin.

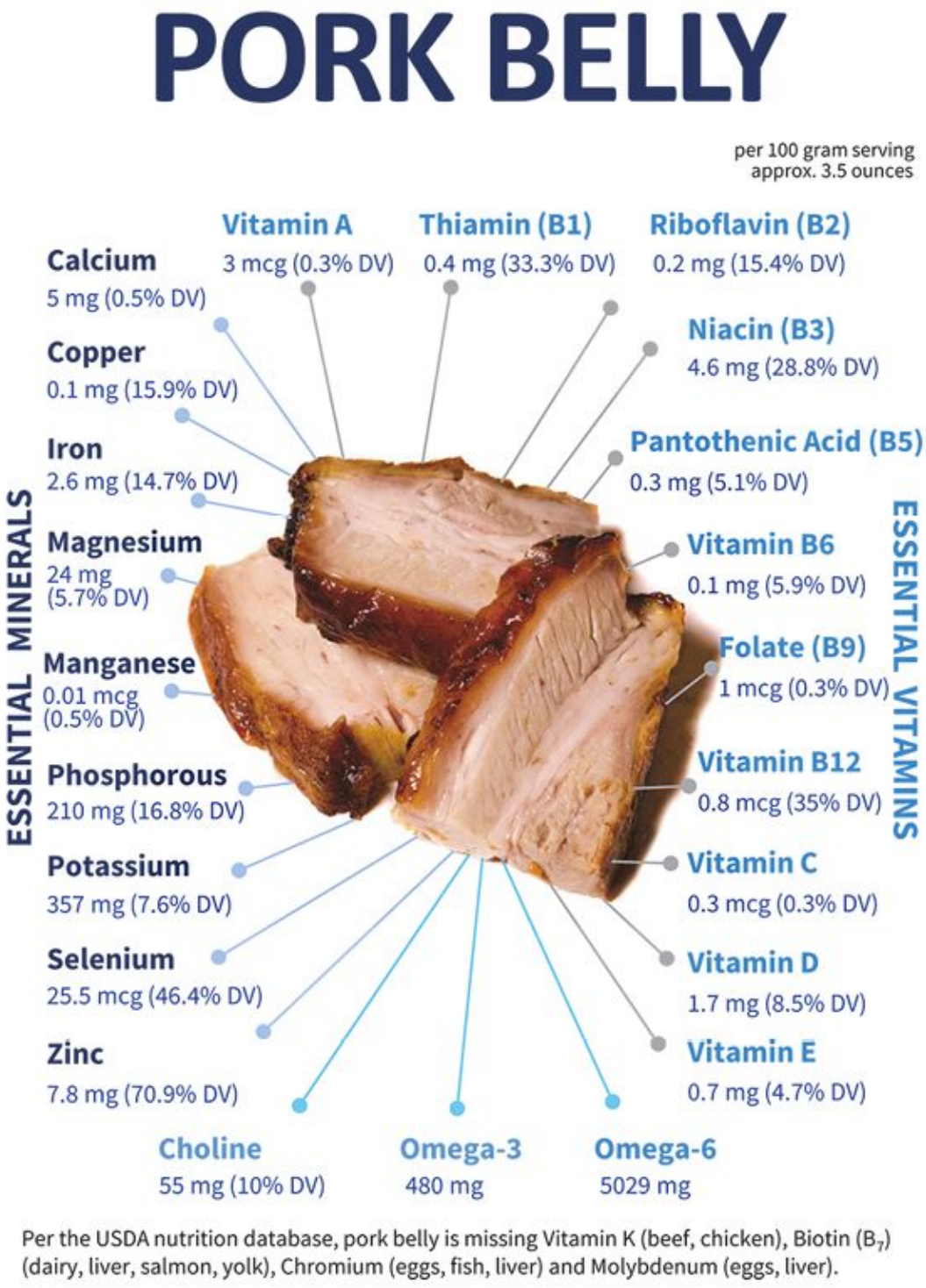


Figure 9.9. Pork Belly.

Pork belly also contains manganese, a mineral that seems to be missing in ribeye and chicken wings, per the USDA's nutrient database. Manganese supports healthy bones by increasing spinal

bone density and delaying the progression of osteoporosis. Manganese also regulates blood sugar, boosts metabolism, has antioxidant capabilities to protect against disease, relieves chronic inflammation and sprains, helps prevent epileptic seizures, is good for thyroid health, and boosts the absorption of nutrients.

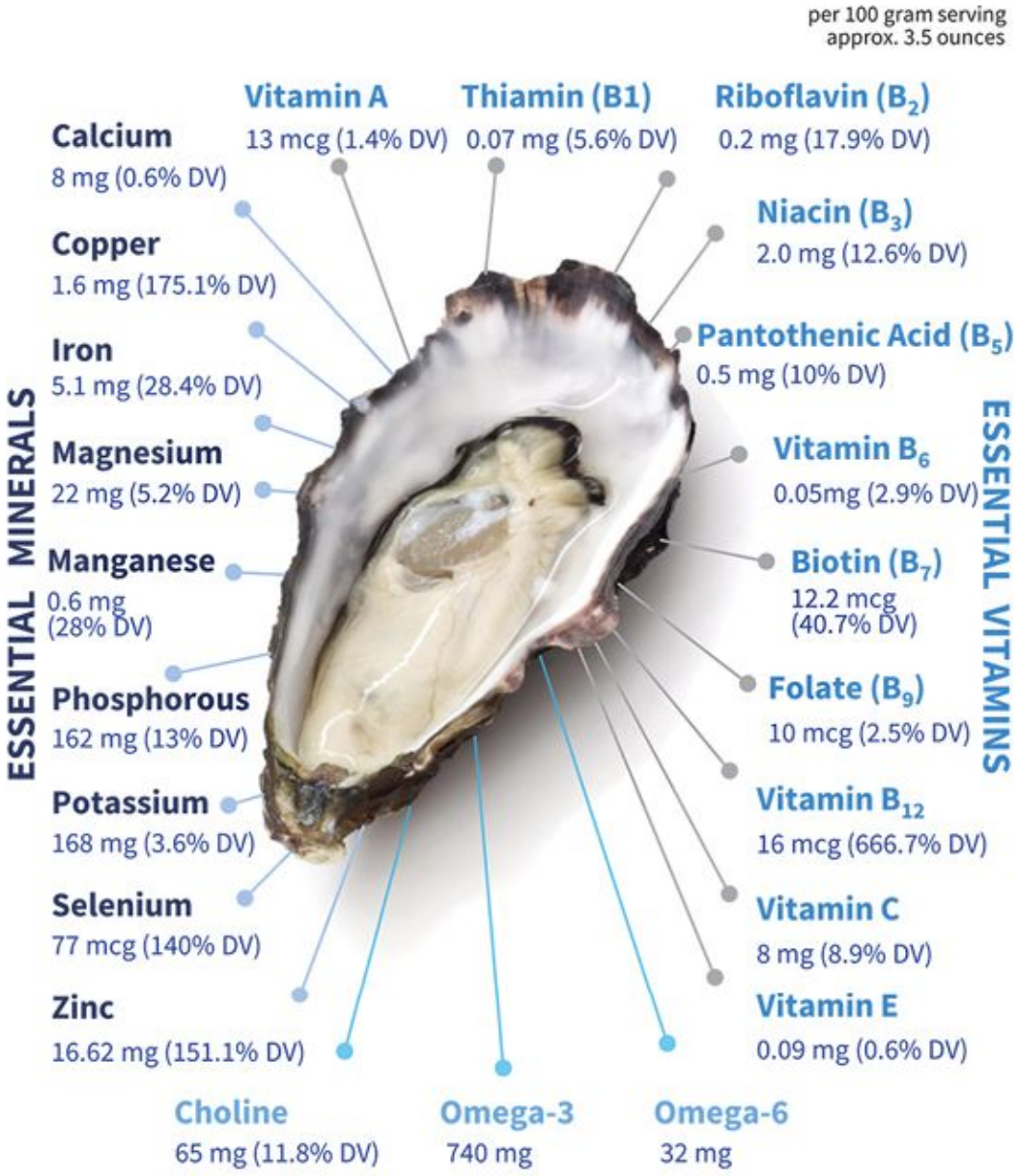
The Power of Oysters

Oysters are extremely rich in zinc, copper, vitamin B12, vitamin D, and selenium. In fact, oysters are food with the highest zinc content. Oysters are so nutrient-dense that 3.5 ounces (100 grams) contain 100 percent of the RDA of vitamin B12, zinc, and copper and more than 75 percent of the RDA of vitamin D and selenium. They also have 37 percent of the RDA of iron and 18 percent of the RDA of manganese.

Oysters have a measurable amount of vitamin C and many essential minerals. Oysters also contain magnesium and potassium, which help lower blood pressure and relax the blood vessels. Six medium-sized oysters will provide 5 percent of your magnesium RDA and 4 percent of your potassium RDA. Oysters are also rich in omega-3 fatty acids and contain all nine essential amino acids.

Oysters also contain an antioxidant (3,5-Dihydroxy-4-methoxybenzyl). It's such an excellent antioxidant that one study showed that it is fifteen times more potent in fighting oxidative stress than Trolox, a commercial vitamin E often used to prevent oxidative stress.[202]

THE OYSTER



Per the USDA nutrition database, oysters are missing Vitamin D (sardines, salmon, dairy), Chromium (eggs, fish, liver) and Molybdenum (eggs, liver).

Figure 9.10. The Oyster.

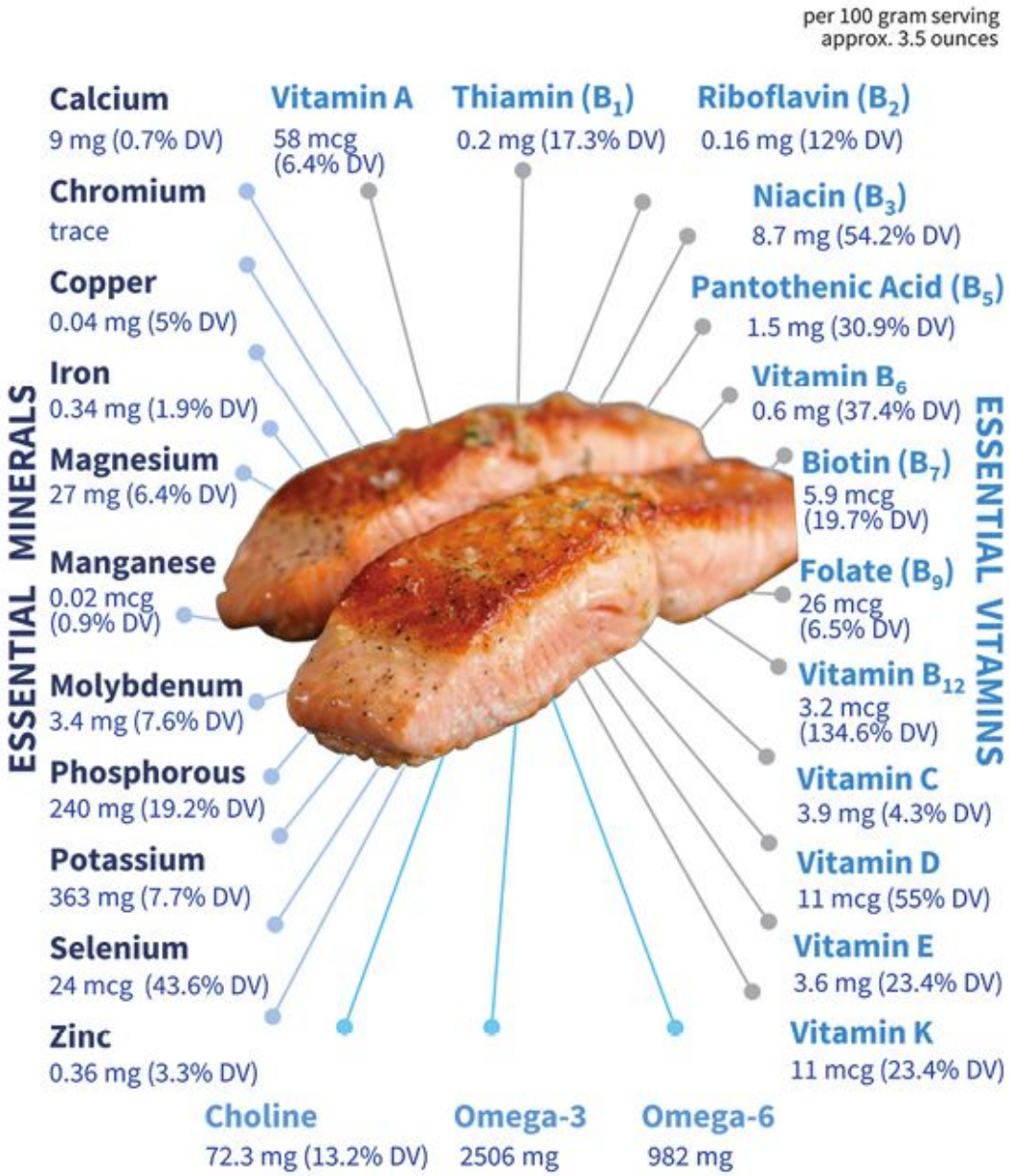
The Power of Salmon

Salmon is high in omega-3s, rich in the B vitamins and selenium, and contains trace amounts of nearly every essential vitamin and mineral.

Salmon also contains antioxidants, including astaxanthin (the red pigment), and this antioxidant seems to reduce oxidation of LDL and increase HDL. Astaxanthin also works with omega-3s to protect the brain and nervous system from oxidation. Sockeye salmon has the most astaxanthin per ounce of all the salmons.[203]

Salmon also has a measurable amount of vitamin C. Salmon is also rich in biotin, strengthening hair and nails and may support hair growth.

ATLANTIC SALMON



Per the USDA nutrition database, there are no essential vitamins and no essential macrominerals missing from salmon.

Figure 9.11. Atlantic Salmon.

The Power of Salmon Roe (Ikura)

Salmon roe has one of the highest concentrations of the two omega-3s essential to human health: DHA and EPA. DHA is vital for brain and eye development. EPA and DHA are essential for eye, heart, immune system, and mental health. A deficiency in omega-3s is associated with cardiovascular disease, depression, diabetes, hypertension, impaired nerve and reproductive systems, and most inflammatory diseases.

DID YOU KNOW?

- *There are different forms of fish oil supplements. You can either get fish oils in the triglyceride form or the manmade ethyl ester form. Through digestion, both are then converted to essential omega-3 fatty acids*
- *The ethyl ester form of omega-3 fatty acid supplements are the most prevalent form in store brand supplements. Ethyl ester is cheaper to make, has a higher boiling point, and is easier to work with when processing for supplements*
- *The ethyl ester form must be filtered through the liver. While breaking down, the ester form releases ethyl alcohol which may also release free radicals, subsequently producing oxidative stress. The body then rebuilds the free fatty acids back into triglycerides in order to be transported in the blood*
- *The rancidity of fish oils is less of a concern because all fish oil supplements are not in their polyunsaturated fatty acid forms—the more fragile and unstable form that can become oxidized. All fish oils go through the digestive process and there they convert to the omega 3 fatty acids*
- *The omega-3 benefits related to fish consumption is in the triglyceride fat form. The triglyceride form can be more readily digested and assimilated by the body compared to the manmade ethyl ester form. Stick to fatty fish, a few times a week or take high quality, triglyceride fish oil supplements*

One ounce of salmon roe contains more than 1,050 milligrams of omega-3s, including 438 milligrams of EPA and 514 milligrams of

DHA. That's more than the one gram daily recommended for heart health by the American Heart Association.[204]

Salmon roe contains every single essential vitamin needed for optimal health. Salmon roe has nearly all the essential minerals needed by the body—more than any other singular food. Salmon roe is arguably the most nutrient-dense food. Salmon roe also outperforms other roes because of the omega-3 fats and vitamin D that work together. Remember, vitamin D is a fat-soluble vitamin and requires healthy fats to be absorbed and used by the body.

Salmon roe also contains vitamin B12, one of the most essential nutrients for brain health. It also contains selenium, a micronutrient with properties of antioxidants and a micronutrient that is not easy to obtain. Brazil nuts are high in selenium, but they also come with a dose of gut-damaging antinutrients.

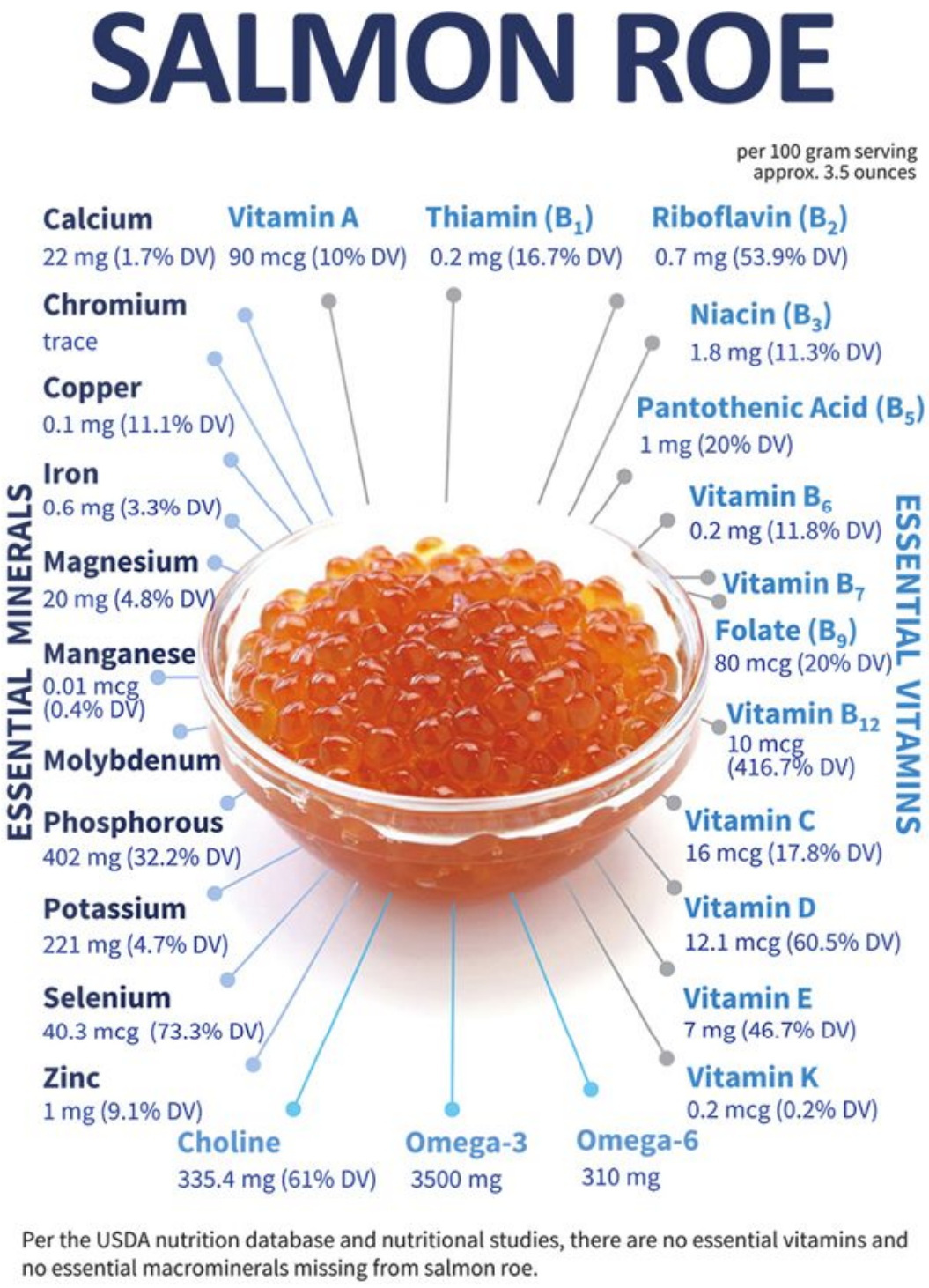


Figure 9.12. Salmon Roe.

Traditional cultures ensured that women and children had first access to salmon roe. Some babies start eating it as early as six months. Knowing the nutrient density of salmon roe and the

importance of EPA and DHA—which manufacturers now add to infant formula—why should we shy away from salmon roe while we are pregnant, nursing, and while a baby is just learning to eat solids?

Women are told to stay away from sushi while pregnant or nursing, but if women can get high-quality sushi, I would question the advice. Is it better to get EPA and DHA in formula and pills than from these natural powerhouse foods? I don't think so.

Pregnant women are recommended to stay away from raw fish because of possible heavy metals, bacteria and other toxins. Yet pregnant women are also recommended to get flu shots (that contain toxins) during their pregnancy.[205]

The Power of Eggs

Eggs are one of nature's perfect foods. Buying the highest-quality eggs is also economical (compared to grass-finished steak). You can get an egg from organic, pasture-raised chickens that are not fed soy for a little more than fifty cents.

Because the yolk supplies all the food the embryo needs to thrive, it's no wonder such a small food packs so much nutrition. The yolk is rich in fats, good cholesterol, proteins, iron, and other minerals, as well as lecithin and other emulsifiers.

For individuals with egg allergies, the problem may be with the egg whites. The albumin in egg whites, with its high protein content, can be the cause of severe allergic reactions such as watery eyes, hives, rashes, redness and swelling, stomach cramps, vomiting, and asthma. It is difficult to say whether egg whites are the precise cause of these reactions as removing all parts of the egg white to consume only the yolk is nearly impossible (even hardboiled eggs cannot remove every trace of egg whites).[206]

If you have sensitivities to chicken eggs, try duck or quail eggs. The albumin makes up 12 percent of egg whites in chicken but only about 2 percent in egg whites from ducks. Studies show that if you have sensitivities to one poultry egg, you may not be sensitive to all poultry eggs.[207]

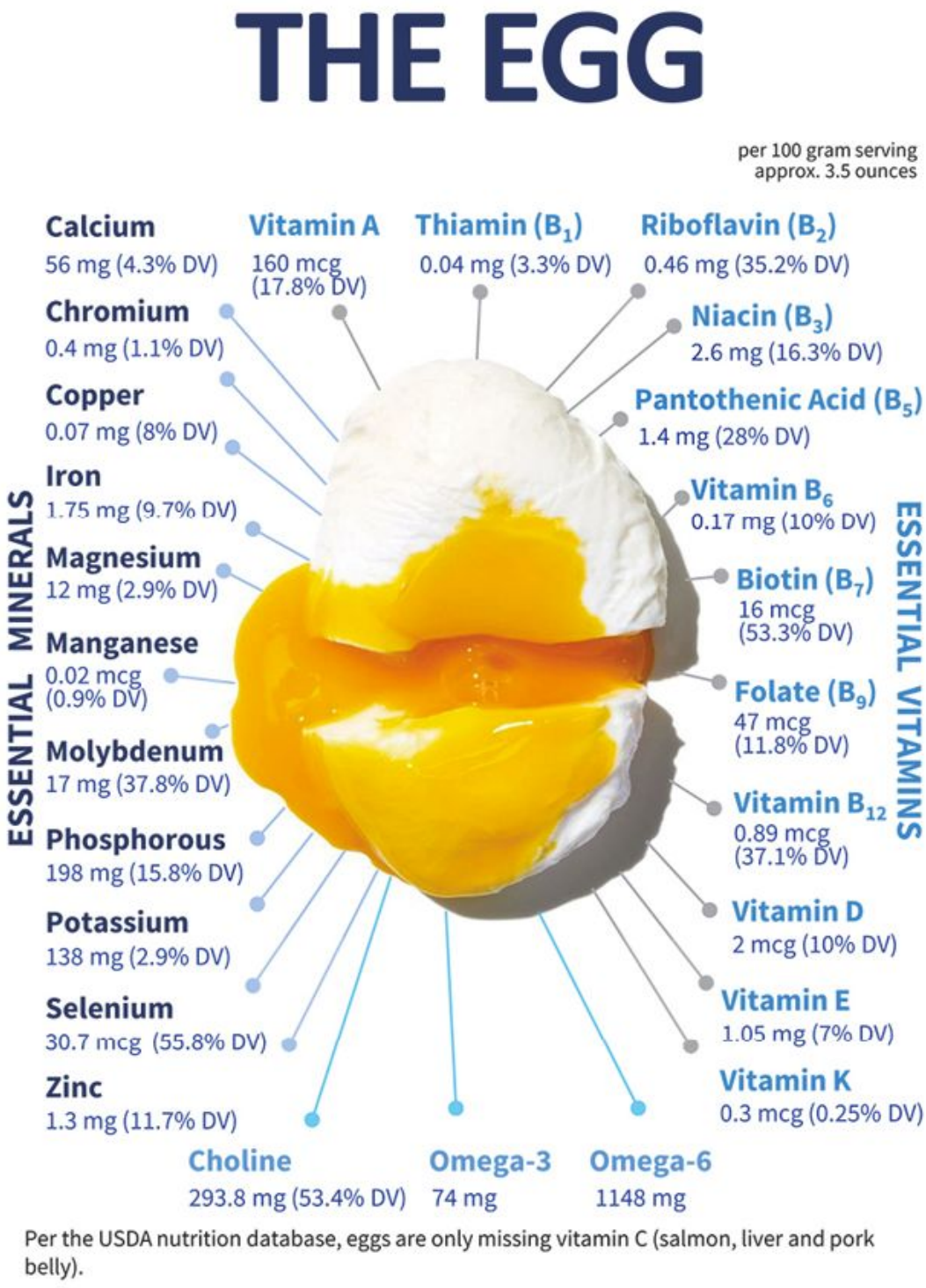


Figure 9.13. The Egg.

Consuming raw egg whites can cause biotin depletion in the body. Biotin deficiencies can lead to seizures, skin disorders, hair loss, severe joint pain, and loss of muscle tone and coordination. When

eggs are cooked, the heat causes structural changes to avidin, making biotin more bioavailable. Shorter cooking times are ideal for removing avidin while keeping most of the nutrients intact.[208]

The best egg sources are local farmers whose operations are certified organic—albeit not guaranteed—and whose chickens are pasture-raised (with no soy or corn feed). These eggs usually have richer, amber yolks, and probably a better nutrient density. But don't focus solely on the yolk color for nutrient density.

Darker orange egg yolks usually mean the hens were pasture-raised and able to forage. The color of the egg yolk is indicative of the hen's diet. The darker the color yolk, the more likely the hen ate carotenoids—the natural orange pigments found in plants. That said, a chicken's optimal diet is not vegetarian but omnivorous. Carotenoids alone determine the color of the yolk. Carotenoids are good, but you want the chicken to have eaten insects and animal proteins by foraging in their natural environment.

The Power (and Danger) of Studies

For a long time, eggs and other cholesterol-rich foods were vilified because of their cholesterol content. Then, in 2015, the U.S. Departments of Agriculture and Health and Human Services quietly removed their warnings about eating foods high in cholesterol. You probably didn't hear about it on the news because no one likes to admit that they were wrong, especially federal agencies.[209]

Why did they remove the guidelines?

There wasn't enough scientific evidence, and studies had found no significant relationship between dietary cholesterol and serum cholesterol. The Ancel Keys, *7 Countries Study (1956),* a

cornerstone study that demonized saturated fats, did not have the statistical significance to demonize cholesterol.

Ancel Keys studied 22 countries. Why only have results of 7 countries? Because the other countries did not fit his experimenter bias (research bias). In fact, Ancel Keys hand-picked the countries to include in the study to further his cause. He left out countries such as France, Holland, and Norway, where they consume a lot of fat but have little heart disease and Chile, where fat consumption is low, but rates of heart disease are high.[210]

DID YOU KNOW?

- *Light causes chickens to lay more eggs but if it is too hot, the will slow down. During the winter, farmers use artificial light to get more egg production. Maybe less egg consumption during peak summer and winter months is more natural and possibly more ideal.*
- *Chickens "forced" to lay more eggs are more stressed out and produce fewer eggs over their lifespan. Chickens may need the rest during the winter months and just like with humans, too much stress will negatively impact their hormones.*
- *Have you noticed in other countries, eggs are left out on room temperature? This is because they do not wash their eggs and in turn, the eggs have a longer and more stable shelf life.*
- *Eggs have a natural protective coating that allows them to last for over a month without having to be refrigerated. But most of us don't like to see feathers, mud and feces on our eggs. The tradeoff is that our eggs require refrigeration immediately and will not hold as long because the outer protective coating has been compromised.*
- *Salmonella may be most common on the outer shells of the eggs. Make sure you trust your source as what the chickens eat will directly impact their feces. Living conditions will also affect the health of the chicken and the eggs.*

Studies funded by food companies don't have to release studies where the outcome wasn't in favor of the food company. In the world of clinical studies, omission is not dishonesty. In fact, in one review

of 206 publications related to health effects on drinks and juices, the publications funded by companies were four to eight times more likely to have favorable conclusions about the company's drink or juice and its health effects. In the 1960s, research funded by the sugar industry downplayed the adverse health effects of sugar.[211]

This is why reading actual studies and understanding the methodology of the studies is essential. We need studies to see trends and understand efficacy. It is illegal—as well as unsafe and unethical—to use the human population as test rodents, which is what has happened with genetically modified foods.

Most nutritional studies are epidemiological studies and observational studies because researchers cannot run their tests on humans. Instead, they consider high correlations.[212] But correlation is a statistical technique that tells us how a pair of variables are related and change together. It does not share the why and how behind the relationship, just that a relationship exists.

Until we have a foolproof way to test and isolate for the causative areas of scrutiny—which we may never have—we should have many quality data points that can paint a more accurate picture.

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Chapter 10

The Environmental and Ethical Dilemma of Eating Meat

When we are no longer able to change a situation - we are challenged to change ourselves.

— Viktor E. Frankl

IT IS VITAL to keep an open mind and consider the foods we eat for optimal health. We've been taught to eat several times a day to manage blood glucose levels. We're told that fat is bad and that we should stick to lean proteins. We are recommended to always pick chicken breast for its high protein and low-fat content. And then because of market demand, food manufacturers inject chickens with hormones to unnaturally grow their breasts. Yes, concentrated animal feed operations or factory farming does have its flaws. It isn't a natural habitat for animals, but eating vegan-meat patties aren't flaw-free either (pea protein and tofu).

Veganism is so new it was coined by Donald Watson in 1944, who founded the Vegan Society. The society defined veganism as "the doctrine that man should live without exploiting animals."[213]

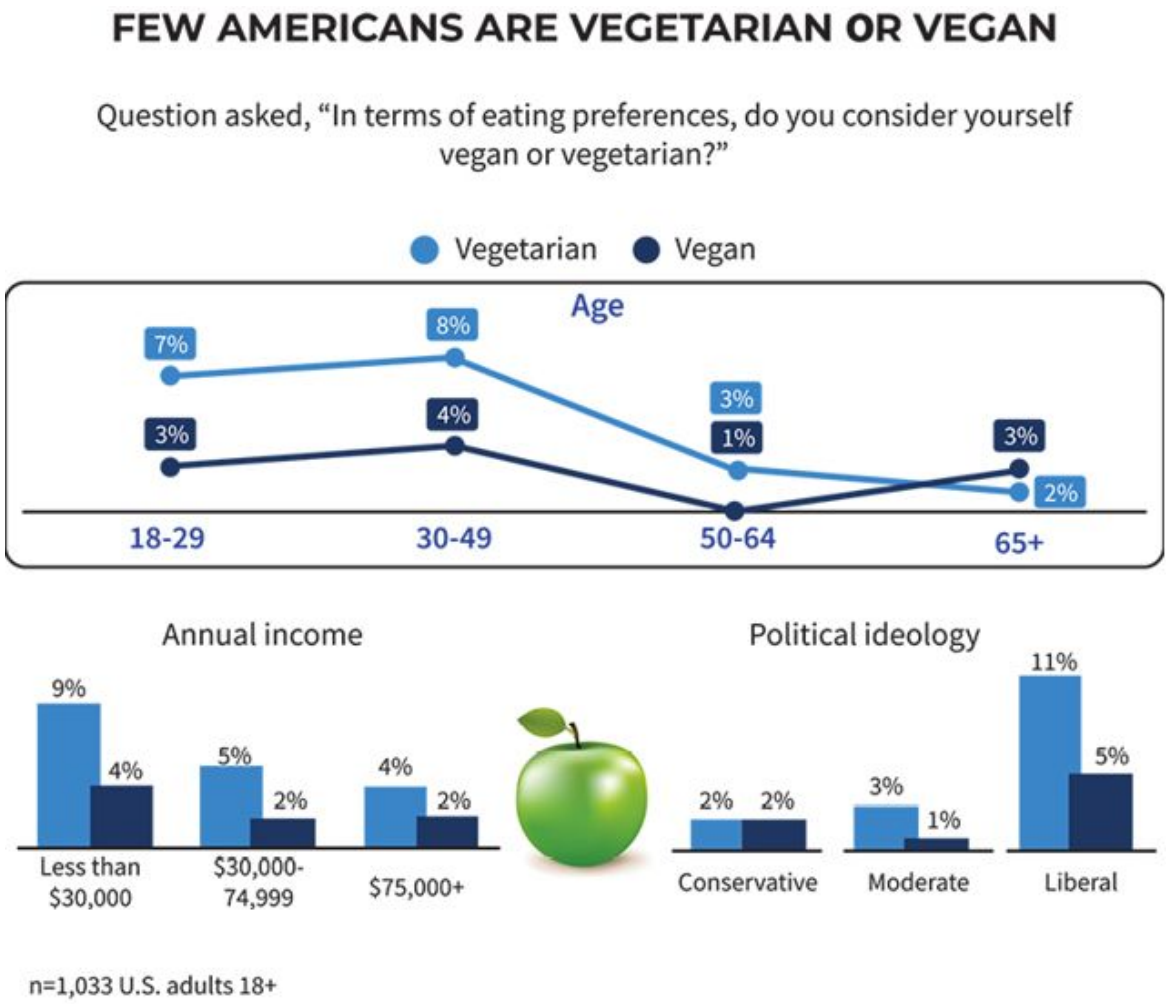


Table 10.1. McCarthy, Niall, "Who are America's Vegans and Vegetarians?," *Forbes*, (2018).

The cycle of life requires all species to play a part in the natural circle of life (and death). Every single person uses tangibles that, at one point, came from an animal. Fertile soils only subsist with animal remnants and excrements. Most vaccines include animal (and human)-derived ingredients (reference Tables 18.10-18.12 in Chapter 18). Should vegans stop getting all vaccines?

There is no easy answer.

If all Americans ate a plant-only diet, the greenhouse effect would save (globally) less than 0.5 percent. In fact, the COVID-19 pandemic has shown that animals don't cause the greenhouse effect—animals were never on lockdown, yet we experienced cleaner air.

We are not equipped to have the U.S. population eat an all-plant diet. We would become deficient in the nutrition requirements for calcium, vitamin A, vitamin B12, and essential fatty acids.[214]

THE MANY USES OF A COW			
BLOOD	**BONES**	**BRAIN**	**HAIR**
• Adhesives • Cake mixes • Dyes and inks • Lab materials • Minerals • Pasta • Vaccines, medicines	• Charcoal • Fertilizer • Glass • Refined sugar	• Anti-aging cream medicines	• Air filters • Brushes • Felt • Insulation • Plaster • Textiles
HOOVES & HORNS	**INTERNAL ORGANS**	**MANURE**	**MILK**
• Adhesives • Emery boards • Lamination • Photo film • Plant & pet food • Plastics • Plywood	• Hormones • Enzymes • Vitamins • Medical material • Instrument strings • Tennis racquet strings	• Fertilizer • Nitrogen • Phosphorous	• Adhesives • Cosmetics • Medicines • Plastics
SKIN		**FAT**	
• Adhesives • Candy • Emery boards • Gelatin • Medicines • Sheet rock • Wallpaper	• Antifreeze • Biodiesel • Candles • Cement • Ceramics • Chalk • Chewing gum • Cosmetics • Creams & lotions	• Crayons • Deodorant • Detergent • Explosives • Fertilizer • Fabric softener • Insulation • Linoleum • Matches	• Medicines • Oil & lubricants • Paint • Pet food • Perfume • Plastics • Rubber • Shaving cream • Textile • Waterproofing agent

Table 10.2. The Many Uses of a Cow.

If the U.S. population only consumed grass-fed, grass-finished meats, there simply wouldn't be enough meat for everyone. Eating vegetarian is not ideal. No single society has been found that survived and thrived solely on plant foods. Plant soil depends on the animal kingdom for nutrients and survival. We also have essential

vitamins that can only be sourced from animals. The synthetic pill forms are not adequate long term.[215]

If we continue the way we have with so much of our land being used for genetically modified crops (to feed people and feed animals in factory farms), that's not going to work either. Our topsoil land is being depleted of nutrients and minerals from chemical crops, and soon our soil will be depleted and barren (meaning, no more crops). We are already feeling the effects of fewer nutrients in animal and plant-based foods.

Buddhist and Hindu cultures practice *ahimsa*, which is the belief in respecting all things and avoiding violence or injury towards one another. Many vegans believe in *ahimsa* towards the proper care of animals. I believe in *ahimsa*. But what about *ahimsa* towards our own selves?[216] If we respect animals to the degradation of our own health, is that practicing *ahimsa*?

What we can do is be good citizens of the world. No one is perfect. We must try to be compassionate individuals, and we can do that by taking care of our health and eating locally, seasonally, and sustainably as best we can.

We must also take care of our homes and live with the least amount of waste as possible. We must teach the next generation to take care of the only home we have and be compassionate toward others. We need to find a balance in feeding ourselves nutrient-dense meats while properly caring and loving our animals. We must properly feed our bodies so that one day when we join the circle of life—as our bodies become one with the soil—we too can offer the most nutrient-dense nourishment for the grasses that the animals will eat to feed our future generations.

Ethical Farming and Climate Change

Many vegans and vegetarians are against eating meat because of the impact on the environment and animal welfare. I will talk through some misinformation in terms of the environment shortly, but animal welfare is a fair argument. As I mentioned, there is no simple answer to feeding nutrient-dense foods to a very-populated world. But population control and birth control pills are also not the answer. For one, birth control depletes women of CoQ10, magnesium, selenium, vitamins B2, B6, B9 (Folate), B12, vitamin C, vitamin E, and zinc.[217]

Grain-Fed vs. Grass-Fed

Animal foods are the best source of omega-3 fatty acids, EPA and DHA. Animals that are fed grain-based feeds containing soy and corn have reduced omega-3s and tend to have more omega-6s than grass-fed animals. But the differing amounts are typically unsubstantial.

Grass-fed is ideal because of fewer hormones, antibiotics, and herbicides than grain-fed meats. Grain-fed animals are often injected with hormones, in a time-released form for rapid weight gain. These animals can also have xenoestrogens from the herbicides used on their feeds.[218] Figure 10.3 shows hormones in foods.

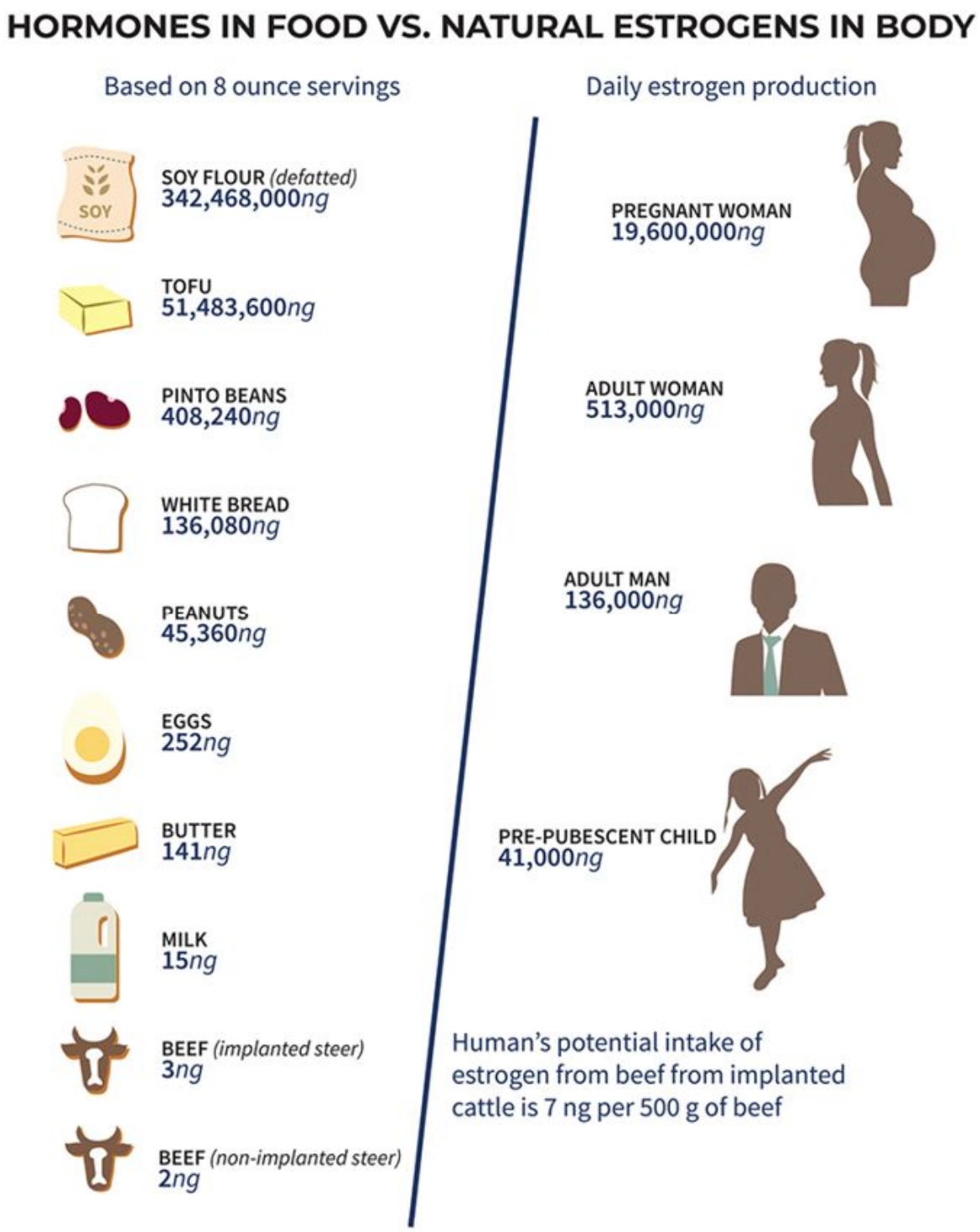


Figure 10.3. Loy, Dan, "Hormones in Cattle," Iowa State University Extension, (2011).

Antibiotics disrupt the microbiome and neurotransmitters. Antibiotics also disrupt K2 production. K2 is primarily made in the large intestine, activates proteins that play a role in blood clotting, and

supports testosterone production. One of the most important functions of vitamin K is to regulate calcium deposits and prevent the calcification of the kidneys and blood vessels.[219]

But finding grass-fed, grass-finished meats isn't so simple. Some grass-fed meat can be labeled grass-fed without the cows ever eating grass. These cows are raised on feedlots, fed only genetically modified feed, like corn stocks. These corn stocks are considered grass because corn or *zea mays* is a member of the grass family, Poaceae. The first corn plants resemble wild grass plants, but with thousands of years of domestication, the corn plant looks like the ones in stores today.

Additionally, grass-fed is no longer regulated by the USDA. On January 12, 2016, the USDA ceased to regulate the term grass-fed. The Agricultural Marketing Service, a branch of the U.S. Department of Agriculture, announced that it was dropping its official definition of grass-fed. In a statement, the AMS claimed that it does not have the authority to define and determine whether specific grass-fed claims that companies make on their packaging are "truthful and not misleading."[220]

This gave feedlot cows—that consume herbicide sprayed genetically modified corn stalks —easier access to be labeled grass-fed. There are also differences with beef being grass-fed, grass-finished and organic.

Grass-fed beef generally means beef from cattle that have eaten only grass or has foraged during their lives. However, many producers call their beef grass-fed but finish the cattle on grain for ninety to one hundred sixty days before slaughter. Grass-finished cattle are raised on grass until the day that they are processed.

BUYING YOUR OWN STEER OR JOINING A COW SHARE

Below are some costs to consider when shopping with your local farmer. Generally, take-home weight prices will range from $5.00 to $7.00 per lb., depending on location.

- *Ask if the per pound fee is the hang weight or the take-home weight. Hang weight is the weight of the carcass when all inedible parts are removed. Oftentimes take-home weight is about 70% of the hang weight.*
- *Ask about slaughter fees. Butcher fees?*
- *Ask about cut types, including bone-in vs. boneless. Ask if there is a fee for bones and fat. Some ranchers include bones and fat for free or at a very discounted rate.*
- *Ask for pricing on organ meat. It should be cheaper than other parts of the steer.*

Table 10.4. Buying Your Own Steer.

One way to circumvent the confusion is by purchasing your own cow (steer) from a farmer or rancher. Buying your own cow can also save money in the long run. Real grass-fed, grass-finished beef can get costly, and it may not be readily available. Our family opts for grass-finished meats, but we also consume conventional meats. The thought is that with most processed foods removed from the diet, our bodies can manage conventional meat toxins. As I've said before, we try to balance real life and ideal eating.

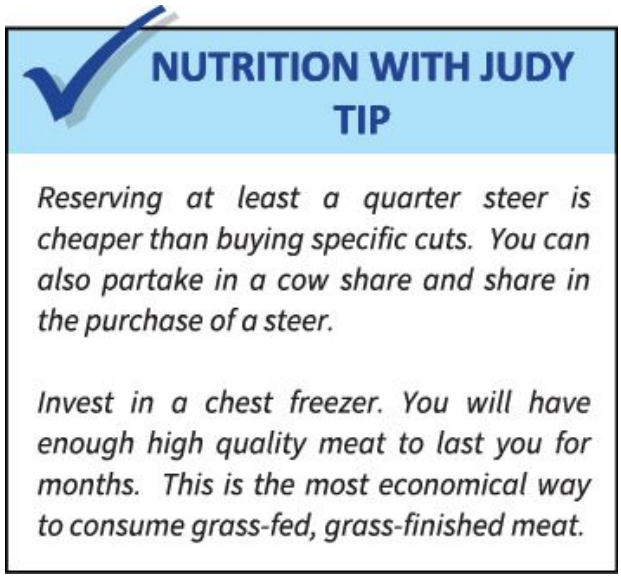
If you have been eating meat-based for a while and still suffer significant autoimmune or gut disease, you may want to try higher-quality meats (or specific types of meats). Sometimes the foods that the animals eat can adversely impact your health—sometimes, you

are fueled by what the animals ate (or what the plants received from the soils).

Climate Change and Greenhouse Gas Emissions

In the United States, livestock is not primarily responsible for greenhouse gas emissions into the environment.

In fact, according to the U.S. Environmental Protection Agency (EPA), beef cattle production was responsible for only 1.9 percent of total U.S. greenhouse gas emissions in 2014.[221]



In the official U.S. EPA report, if you take a look at the data and do some math, you get to the 1.9 percentage:

1. Total U.S. greenhouse gas emissions and sinks of 2014
2. Total U.S. greenhouse gas emissions from beef cattle (manure CH_4 and N_{20}, enteric fermentation CH_4)
3. Divide the second number over the first number
4. Convert to percentage

You do have to rummage through the tables (558-page report), but you can easily get the data.[222] You can see the U.S. greenhouse gas

emissions in Figure 10.5.

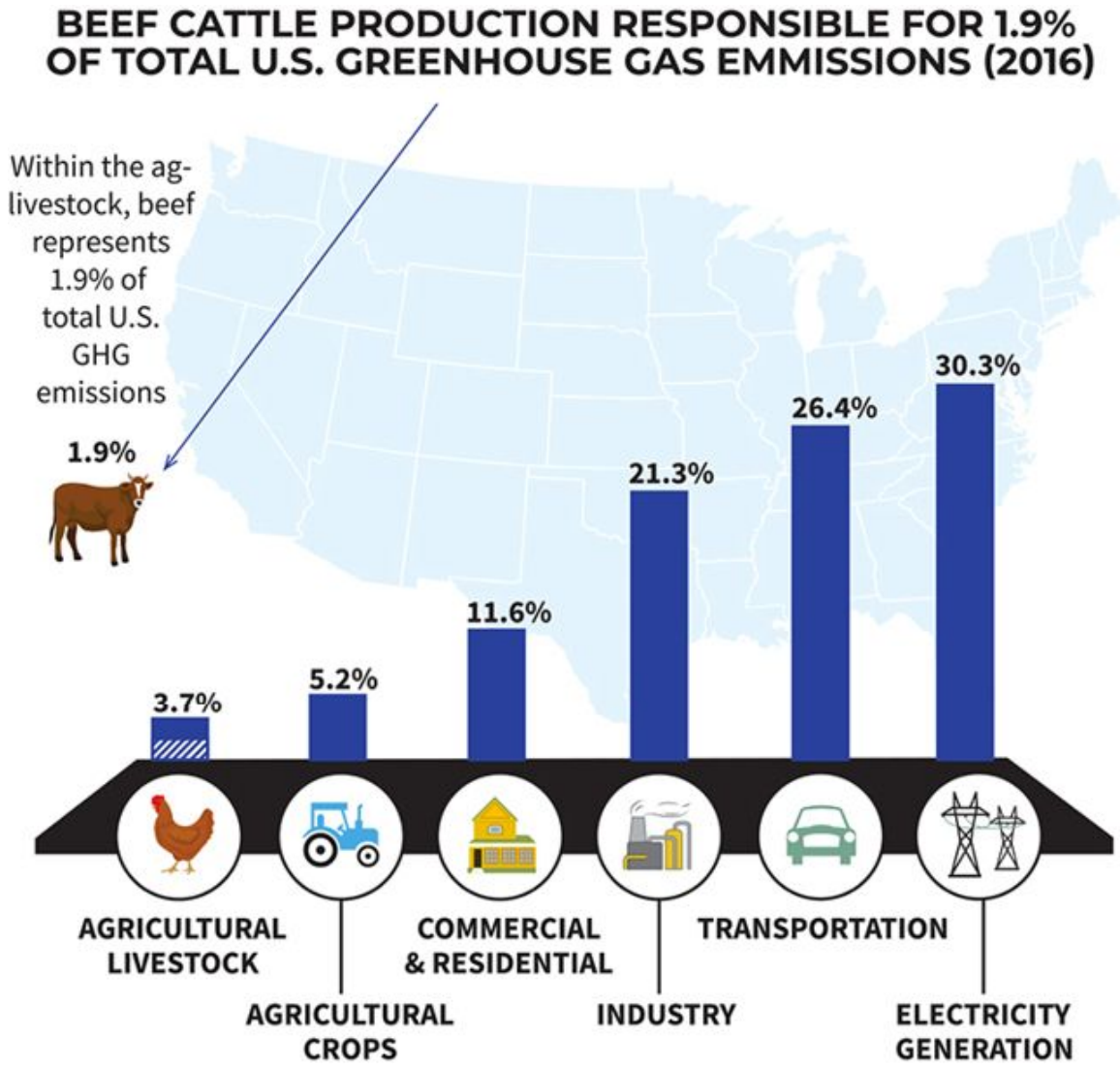


Figure 10.5. EPA, "Inventory of U.S. Greenhouse Gas Emissions and Sinks," EPA430-R-16-002, (2016).

There's also data on corn yield and greenhouse gas emissions. Most people believe that livestock consumes most of the corn crops, but most grain-fed livestock eats the nonedible parts of corn and other grain foods. Most of the genetically modified corn and soy crops are not for animal consumption.[223]

Many people believe that grain-fed cattle is toxic to the environment. Let's take a closer look.

A typical life cycle phase for cattle includes a calf-to-cow phase (six to ten months), and then the grain-finishing phase (forage diet, grass-finished is two to six months). Grain-finished cattle have about 50 to 85 percent grain in their diet, a lifecycle of about four to six months and an average harvest weight of 1,200 to 1,400 lbs.[224]

Grass-finished cattle have zero percent grain in the diet, have a lifecycle of about six to ten months, and an average harvest weight of 1,000 to 1,200 lbs. Grain-finished can have an 18.50 to 67.5 percent lower carbon footprint than grass-finished due to shorter lifecycles and higher carcass weight at harvest.

TOTAL GHG EMISSIONS FROM BEEF

According to the U.S. Environmental Protection Agency (EPA), beef cattle production was responsible for only 1.9% of total U.S. greenhouse gas emissions in 2014. Below is how I got to the numbers:

EPA DOC 430-R-16-002 SECTION	PAGE
• Total 2014 U.S. Greenhouse Gas Emissions	• Page 29, 30
• Table ES-2: Recent Trends in the U.S. Greenhouse Gas Emissions and Sinks (MMT CO_2 Eq.) ○ Net CO_2 5556 ○ CH_4 403.5 ○ N_20 166.7 ○ HFC 166.7 ○ PFC 5.6 ○ NF_3 0.5 **TOTAL 6870**	• Page 28
• Total U.S. Greenhouse Gas by Percentage ○ CH_4 10.60% ○ CO_2 80.90% ○ N_20 5.90%	• Page 31
• Table 5-3: CH_4 Emissions from Enteric Fermentation (MMQ CO_2 Eq.) ○ **Beef Cattle CH_4 Enteric 116.7** ○ Total CH_4 Possible 164.3	• Page 319
• Table 5-6: CH_4 and N_20 Emissions from Manure Management (MMQ CO_2 Eq.) ○ **Beef Cattle CH_4 Manure 3** Total CH_4 Possible 61.2 ○ **Beef Cattle N_20 Manure 7.8** Total N_20 Possible 17.5 ○ **Beef Cattle CH_4 + CH_4 + N_20** 116.7 + 3 + 7.8 = **127.5**	• Page 81-82
• Agriculture as a Portion of Emissions 573.6 or 8.30%	• Page 317, 325
• Total Emissions from Beef 127.5/6870 = 0.018559 **1.90%**	

Table 10.6. Ibid Table 10.5.

Initially, grass-finished can have higher methane emissions (a greenhouse gas in natural gas) than grain-finished, since grass-finished cattle continue to forage and spend longer times in the

finishing phase. However, once carbon sequestration—a process to remove the greenhouse gas, carbon dioxide, from the atmosphere—associated with grass-finished beef is accounted for, it lowers the grass-finished carbon footprint by 42 percent.[225]

Theoretically, for every two-and-a-half to six grass-finished cows, there is one less grain-fed cow. If a grain-finished cow weighs 200 to 400 pounds more than a grass-finished cow at harvest, the extra meat provides more nutrient-dense meat for people that may never have been able to afford or have access to grass-finished meats. Nutritionally, any whole food raw meat is superior to any plant-based food. Meat doesn't have antinutrients, and it doesn't have nutrients that first need to be converted in the body to be utilized. Reference Chapter 5 (genetically modified foods) and Chapter 6 (plant toxins) for details.

You may have heard that the cows' flatulence is polluting the environment—it's the burps that release 85 to 90 percent of methane from cows. Only about 5 to 10 percent of cows' methane is released from manure and flatulence.

Methane (CH_4) pollution causes 25 percent of global warming. While carbon dioxide is a major greenhouse gas—accounting for 81 percent of emissions—methane is more potent over twenty years, as it traps 84 times more heat. Methane is the primary component of natural gas, which makes up roughly 22 percent of the world's electricity, second to coal. With adequate oxygen, methane burns to release carbon dioxide and water, and some methane can be managed with carbon sequestering.

The United Nations' says that livestock is responsible for about 14.5 percent of global greenhouse gas emissions, of which 44 percent is methane (CH_4), 29 percent is nitrous oxide (N_20), and 27 percent is

carbon dioxide (CO_2). Based on the United Nations' numbers, livestock's global methane impact on greenhouse gas emissions is 0.0638 or six percent. It accounts for 1.8 percent of the total greenhouse gas emissions in the United States. In fact, in a 2010 climate change report, the United Nations admitted flaws in their reporting on meat and climate change.[226]

Instead, most methane naturally occurs from decaying vegetation, rice paddy fields, human use (oil industry), and plastic grocery bags.

Water Usage

Meat production is thought to have a high-water footprint, but this depends on how the animal is raised—grass- or grain-fed matters. Even with high numbers, most of the total water (98 percent) is the water footprint of the feed for animals. Drinking water, service water, and feed mixing water for the animals account for less than 2 percent.[227]

Even still, water used in the production of meat is much lower than water used to grow nuts. Ninety-nine percent of all U.S. almonds are grown in drought-prone California. One almond requires nearly 1.1 gallons of water.[228]

Much of California's agriculture is concentrated in parts of the state where droughts hit the hardest. For example, Monterey County—which endured an "exceptional drought"— grew nearly half of America's lettuce and broccoli in 2012.[229]

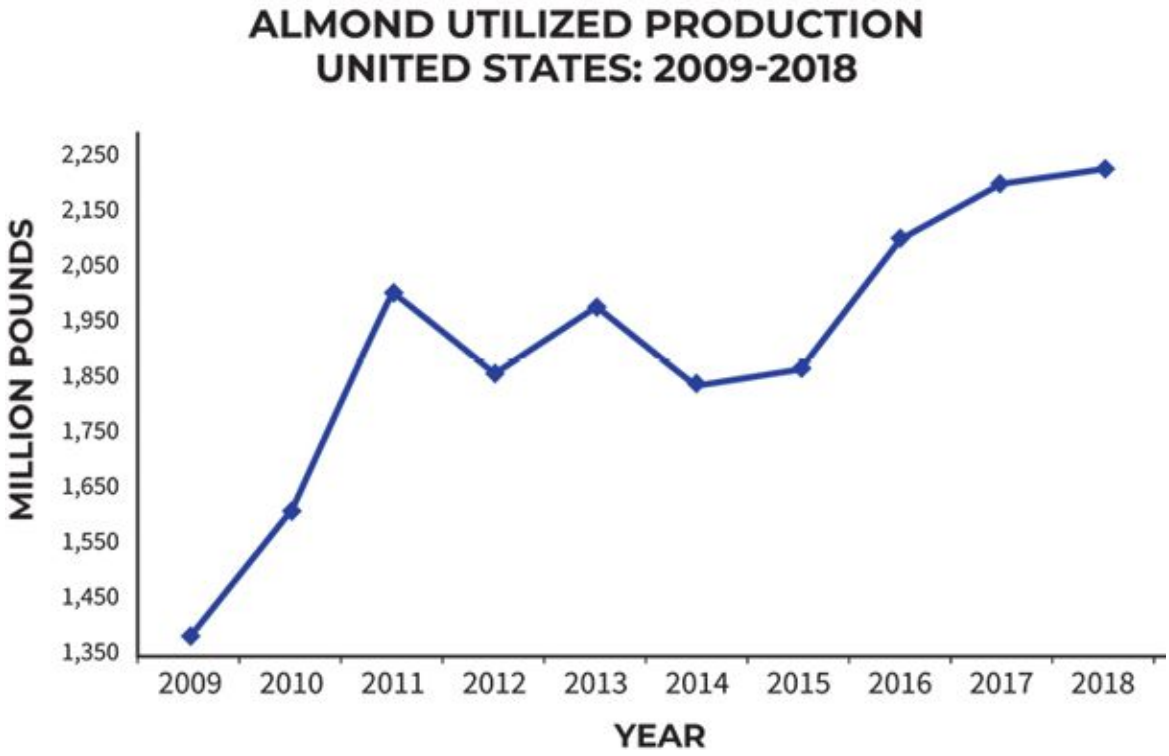


Table 10.7. USDA, "Almond Utilized Production," (2018).

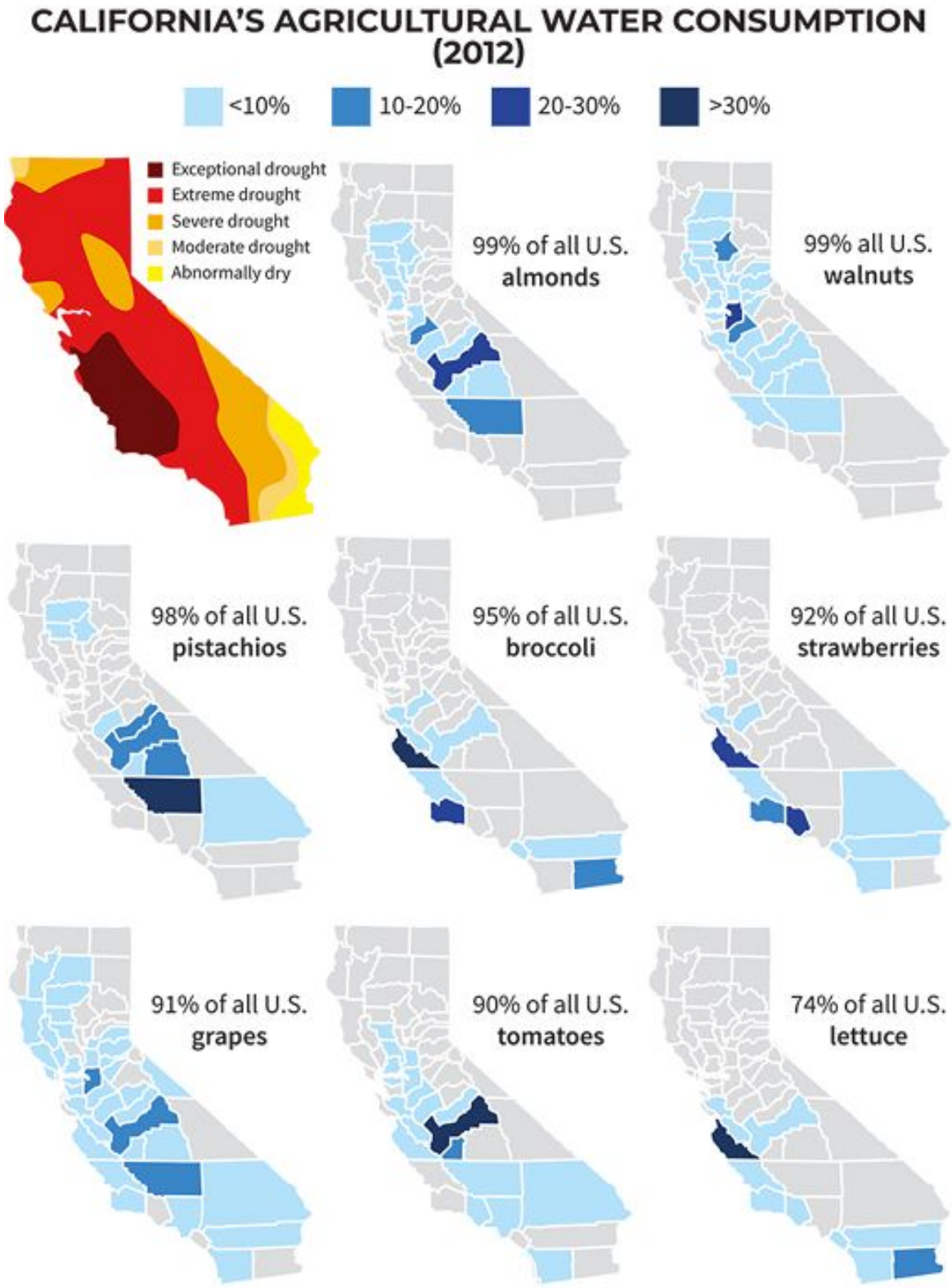


Figure 10.8. U.S. Drought Monitor, California Department of Food and Agriculture, USDA.

Faulty Trends

Many greenhouse gas emission charts include rice as part of the livestock data for greenhouse gas emission burdens—labeling it agriculture but using a cow icon. I'm sure most people read agriculture, see a cow icon, and then think rice and other plant crops.

As for plants and their water burden, some may take less water to grow than animals, but the numbers do not consider the total burden of cost, including bringing water to a drought-prone area.

Animals Deaths in Plant-Based Foods

Many animals die when crops are harvested. The tillage of digging, stirring, overturning, shoveling, hoeing, and raking disturb many ecosystems that cause direct harm to animals.

Plowing and harvesting kill many small mammals, lizards, and snakes. Additionally, millions of mice are killed in grain storage facilities every year.[230]

In a 2011 report, at least fifty-five sentient animals die to produce 100 kilograms of edible plant-based foods, twenty-five times more than the same amount of deaths for pastured beef. Most of the plant-based is for human consumption.[231]

In Australia, the production of wheat and other grains is estimated to kill twenty-five times more animals per kilogram of useable protein and is more damaging to the environment than farming red meat. When harvesting wheat and other grains, the land is cleared, resulting in thousands of animals and plants being removed.[232]

When land is cleared to produce monocrops (growing a single crop, year after year), native vegetation and nutrient-rich soils are lost. Forcing land to produce foods non-native to the land requires many

fertilizers, herbicides, pesticides, and other toxins that adversely impact biodiversity and the overall earth's ecosystem.

When cows are fed on pastures, the grazing is on natural ecosystems. This allows for higher levels of biodiversity compared to that of croplands. These lands also cannot be used to produce plant foods and have no impact on the production of plant-based foods.[233]

Carbon Sequestering and Regenerative Agriculture

Carbon dioxide (CO_2) regulates the temperature of the earth. Many different mechanisms (the carbon cycle) influence the CO_2 concentration in the atmosphere. Carbon sequestration is naturally storing carbon dioxide to mitigate global warming (via chemical and physical processes). Agricultural carbon sequestration may be one of the most cost-effective ways to slow global warming.[234]

Some people believe that animal feed is what causes adverse effects on climate change. Let's look at corn as an example.

According to the U.S. Department of Agriculture, corn accounts for 7 percent of a grain-fed cow's diet (and remember, it's mostly corn stock). The percentage of corn used for fuel production (ethanol) has increased by nearly 40 percent in the last 20 years. The percentage of corn used for all livestock feed has decreased as fuel production increases. Ninety percent of the feed for grain-finished beef cattle comprises human-inedible feed such as forage and plant-based leftovers. The United States has over 770 million acres of land that is unsuitable for cultivation. By cows grazing on this land, the agricultural lands in other regions can be available for food crop production.[235]

Regenerative Agriculture

Regenerative agriculture is a conservation and rehabilitation approach to farming and food systems. It focuses on topsoil regeneration, improving and increasing water cycles, biodiversity, biosequestration, and enhancing ecosystems. Regenerative agriculture would strengthen the health of farm soil and support the fight against climate change.

There are several reputable regenerative agriculture farms, such as White Oak Pastures in Bluffton, Georgia, and Polyface Farms in Swoope, Virginia. Summarizing Joel Salatin from Polyface Farms: grass has a faster metabolism than trees and shrubs, and the deepest soils on the planet grow under herbivores and grasslands.

Perennials (Grass) build soil because their energy flow makes the soil rich in nutrients. Perennials take in solar energy, they inhale carbon dioxide and then split off the oxygen so humans can breathe. Perennials split off carbons and put them in cellulose (part of the plant) to feed the soil. In the process of feeding the soil, the plant makes sugars (polysaccharides) that it puts in the soil as energy and creates a bank account of energy for plants.[236]

Annuals (Grain) are the opposite. They put energy in the seeds and not the soil. Annuals push energy up to the seed on the plant, and so if anything happens to the plant, the seed can continue life forward. While the seed survives, the soil becomes barren.[237] Figures 10.9 and 10.10 depict nutritional changes and mineral content decline in our foods.

THE NUTRITIONAL CHANGES IN FOOD

The following nutritional information is from the USDA database. Each food is based on 100 grams.

NUTRITION	1963	1992	% CHANGE
Apples			
Calcium	• 7 mg	• 7 mg	• 0.00
Iron	• 0.3 mg	• 0.18 mg	• -40.00
Magnesium	• 8 mg	• 5 mg	• -37.50
Phosphorous	• 10 mg	• 7 mg	• -30.00
Potassium	• 110 mg	• 115 mg	• +4.55
Vitamin A	• 90 IU	• 53 IU	• -41.11
Vitamin C	• 4 mg	• 5.7 mg	• +42.50
Carrots			
Calcium	• 37 mg	• 27 mg	• -27.03
Iron	• 0.7 mg	• 0.5 mg	• -28.57
Magnesium	• 23 mg	• 15 mg	• -34.78
Phosphorous	• 36 mg	• 44 mg	• +22.22
Potassium	• 341 mg	• 323 mg	• -5.28
Tomatoes			
Calcium	• 13 mg	• 5 mg	• -61.54
Iron	• 0.5 mg	• 0.45 mg	• -10.00
Magnesium	• 14 mg	• 11 mg	• -21.43
Phosphorous	• 27 mg	• 24 mg	• -11.11
Potassium	• 244 mg	• 222 mg	• -9.02

Table 10.9. Davis, Carole et al., "Dietary Recommendations and How They've Changed," USDA.

MINERAL CONTENT DECLINE

The following information is from the USDA database and Lindlaar, 1914. Each food is based on 100 grams.

	MINERAL	1914	1948	1992
Cabbage	Calcium	• 248 mg	• 38.75 mg	• 47 mg
	Magnesium	• 66 mg	• 29.6 mg	• 15 mg
	Iron	• 8 mg	• 5.7 mg	• 0.59 mg
Lettuce	Calcium	• 265.5 mg	• 38.5 mg	• 19 mg
	Magnesium	• 112 mg	• 31.2 mg	• 9 mg
	Iron	• 94 mg	• 26.25 mg	• 0.5 mg
Spinach	Calcium	• 227.3 mg	• 71.75 mg	• 99 mg
	Magnesium	• 112 mg	• 125.4 mg	• 79 mg
	Iron	• 64 mg	• 80.15 mg	• 2.7 mg

CHANGE IN NUTRIENTS 1914 — 1992

Composite data includes apples, bananas, broccoli, carrots, celery, chard, collard greens, corn, iceberg lettuce, potatoes, romaine lettuce, and tomatoes.

	% CHANGE
Calcium	-29.82
Iron	-32.00
Magnesium	-21.08
Phosphorous	-11.09
Lettuce	-6.48

Table 10.10. Mineral Content Decline and Change in Nutrients.

Grass provides nutrients in the soil for generations. Grains remove any nutrients from the soil and make any future crops further depleted in nutrients.

This is where grass-fed is optimal—not specifically for nutrient density, not necessarily because of climate change, but for our future generations. If we let nature run its course, we can save the soils for our children's children.

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Chapter 11

Nutritional Concerns on a Carnivore Diet

There are no facts, only interpretations.

— Friedrich Nietzsche

THE CARNIVORE DIET is often criticized because it does not follow the Recommended Dietary Allowance (RDA) levels—too little vitamin C and too much cholesterol. Many people are concerned that the diet will cause nutritional imbalances. Let's talk through some of the nutritional areas of concern.

Calcium

With the help of saturated fats, calcium is correctly put in our bones. The body's mineral supply is almost all in the skeletal system. In fact, 99 percent of the human body's calcium is stored in the bones. Bones play a vital role in the body's calcium balance. Calcium is made available for other tissues only when the body breaks down old bone during remodeling.[238]

If you refer to Figure 11.1, bone remodeling happens in two phases: osteoclasts (bone cells) break down bones, and then osteoblasts (other types of bone cells) create new bones. The parathyroid hormone (PTH) plays a critical factor in the bone remodeling process. High levels of PTH can overly activate osteoclasts and cause too much bone breakdown.

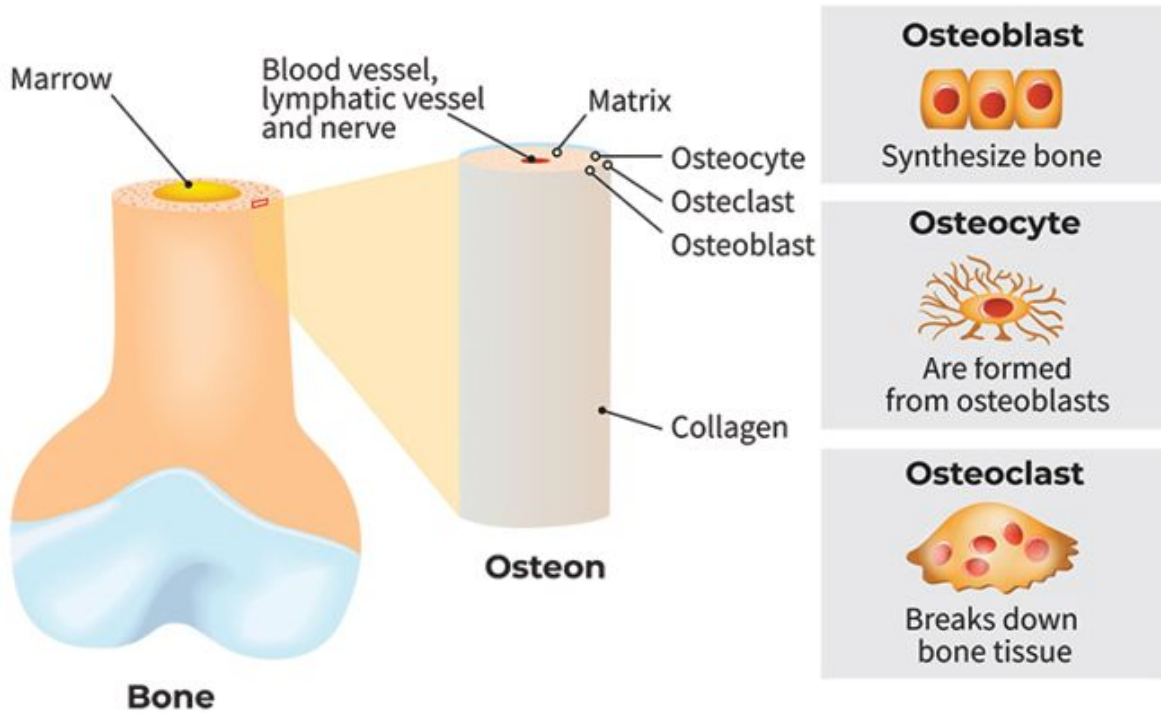
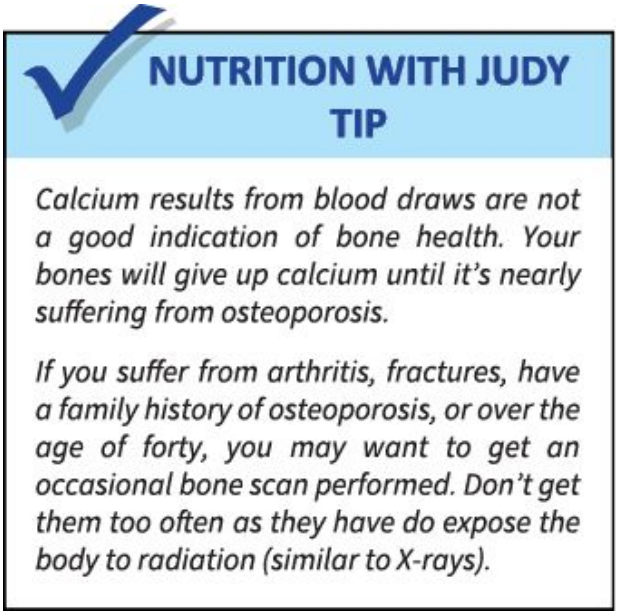


Table 11.1. Internal Structure of a Bone.

What causes excess PTH?

Calcium imbalance in the blood. The interaction between calcium, vitamin D and parathyroid hormone regulates calcium levels in the body. When there are imbalances of calcium in the blood, our bones release calcium in the blood to find homeostasis.



The modern world has caused us to be deficient in calcium but not because of a dietary calcium shortage. Most individuals get enough calcium, but often they are missing the cofactors that allow the body to absorb calcium. This is why taking calcium supplements can be dangerous if you don't have a calcium deficit.

CALCIUM AND COFACTORS

MAIN COFACTORS	COFACTORS	SUPPORT
1 System pH	Calcium is released from the bones and deposited in the blood when its pH becomes too acidic. Calcium from the blood is deposited in bone when the blood pH level becomes too alkaline. When blood becomes too alkaline, excess calcium gets deposited in tissues, which are known as bone spurs.	• L-Glutamine
2 Hydration	Proper hydration is needed for the blood to be fluid enough to transport calcium throughout the body. A proper balance of electrolytes—calcium, potassium, sodium, and chloride—allows for the appropriate transfer of calcium in and out of the cells.	• Water and electrolytes • Kidney tissue • Nutrients for renal function • Culture of beet juice containing arginase
3 Hormonal function	The exchange of calcium between bone and blood requires the parathyroid hormone (PTH). PTH encourages the breakdown and repair of bones, which frees up calcium. PTH also decreases the loss of calcium in the urine. Vitamin D works with PTH to increase levels of calcium in the blood, which increases vitamin absorption from foods, pulls calcium from bone and tissues, and decreases loss in feces. Vitamin D can help regulate calcium metabolism, phosphorous, and the calcification of bones in the body. Vitamin D helps increase calcium absorption from the gut and helps to maintain normal blood levels of calcium and phosphorous. Vitamin D is low in most plant foods. Strict vegetarians who don't get enough sunlight should ensure they get adequate amounts of supplemental vitamin D.	• Nutrients for female health • Nutrients for thyroid function • Adrenal tissue • Ovary tissue • Pituitary/hypothalamus • Glandular for female endocrine health • Glandular for male endocrine health • Thyroid glandular
4 Vitamins		• Vitamin A • Vitamin D • Vitamin E • Potassium iodide
5 Digestive	Calcium also must be balanced with minerals to have proper homeostasis. Manganese, boron, copper, and zinc are needed for the proper functioning of calcium.	• Betaine HCl • Pepsin • Pancreatin
6 Fatty acids	Calcium can only be absorbed in an environment that has sufficient levels of hydrochloric acid. Fatty acids are necessary for the transport of calcium across the cell membrane, and into the cell. Fatty acids also help to increase the calcium levels in tissues.	• Omega 3, 6, 9 • Black currant seed oil • EPA and DHA from fish oil
7 Other cofactors		Oxygenation • Gingko biloba • Di-Methylglycine (B_{15}) • Antioxidants Heavy Metals • Glutathione, cysteine, and glycine, lung supports

Table 11.2. Al-Dujaili et al., "Calcium Sensing Receptor ... in Bone," 1556-1567. (2009).

In a separate analysis using data from a 1997 survey, “researchers found that women with a dietary calcium intake of 1,400 mg or more daily who also took a calcium tablets (500 mg of calcium) had a 2.57-fold risk of death from all causes compared to women with a calcium intake of 600 mg to 999 mg daily. Further analysis revealed that, in women with a high dietary intake of calcium, the addition of a calcium supplement increased the risk of death in a dose-dependent fashion.”[239]

CALCIUM AND HORMONES

	HORMONES	RELATIONSHIP WITH CALCIUM
1	Adrenal hormones	• Mineralocorticoids control sodium and potassium homeostasis, which have a relationship with calcium
2	Parathyroid hormone	• A primary hormone regulating blood calcium levels
3	Sex hormones	• Estrogen inhibits osteoclastic activity • Progesterone promotes osteoblastic activity • Testosterone is a precursor to estrogen and progesterone
4	Thyroid hormone (calcitonin)	• Inhibits osteoclastic activity • Decrease blood calcium levels

Table 11.3 .Calcium and Hormones

Some of these cofactors include proper digestion and adequate levels of fatty acids. Calcium can only be absorbed in an environment that has sufficient levels of hydrochloric acid. Fatty acids are necessary for the transport of calcium across the cell membrane and into the cell. Fatty acids also help to increase the calcium levels in tissues. Proper hydration is also needed for the blood to be fluid enough to transport calcium throughout the body. A

proper balance of electrolytes—calcium, potassium, sodium, and chloride bicarbonate—allows for the appropriate transfer of calcium in and out of the cells (references Tables 11.2 and 11.3).

Taking only calcium without balancing magnesium, vitamin D, and vitamin K has been shown to have adverse effects, such as building up plaque in coronary arteries and even causing heart attacks. Calcium should always be balanced with bone health supports, such as fat-soluble vitamins.[240]

Instead of trying to find the optimal amount to take, consume foods that have these nutrients naturally in balance.

ANIMAL-BASED FOODS HIGH IN CALCIUM

The following foods have some of the highest amounts of magnesium per 100g serving. (USDA)

FOOD	AMOUNT PER 100 G	
Sardines	• 382 mg	
Caviar, cured	• 275 mg	
Anchovy, canned	• 232 mg	
Cuttlefish, raw	• 90 mg	
Pork feet, ham hock, raw	• 70 mg	
Beef tripe	• 69 mg	
Herring, Atlantic, raw	• 57 mg	
Octopus, raw	• 53 mg	
Shrimp, raw	• 52 mg	
Lobster	• 48 mg	
Salmon, raw	• 23 mg	
Pork ribs, raw	• 22 mg	
Salmon roe, cured	• 22 mg	
Lamb leg, raw	• 10 mg	
Ribeye, raw	• 10 mg	
Chicken, dark, raw	• 9 mg	
Chicken liver, raw	• 8 mg	
Beef liver, raw	• 5 mg	

Table 11.4. Animal-Based Foods High in Calcium.

Vitamin D

The body needs cholesterol to make vitamin D. Vitamin D is made from cholesterol in the skin when exposed to sunlight. During times of less sunlight, you need vitamin D from cholesterol-rich foods.

Vitamin D is a highly debated nutrient to supplement, possibly because it's a hormone and not technically a vitamin. Exogenously treating hormones is always tricky—you don't know what other hormones pathways you are impacting.

The two sides that debate whether you should supplement don't just disagree, they are opposite extremes.

Taking vitamin D alone can cause deficiencies in vitamins A and K. Fat-soluble vitamins work together to balance processes in the body, including the balance of calcium. Some supplements combine vitamin D and K but do not include vitamin A. When too much vitamin D is in the body, it can deplete the body of vitamin A. Having too much vitamin D may also cause excessive levels of calcium in the blood and may even weaken bones, cause kidney problems, and interfere with how the heart and brain work.

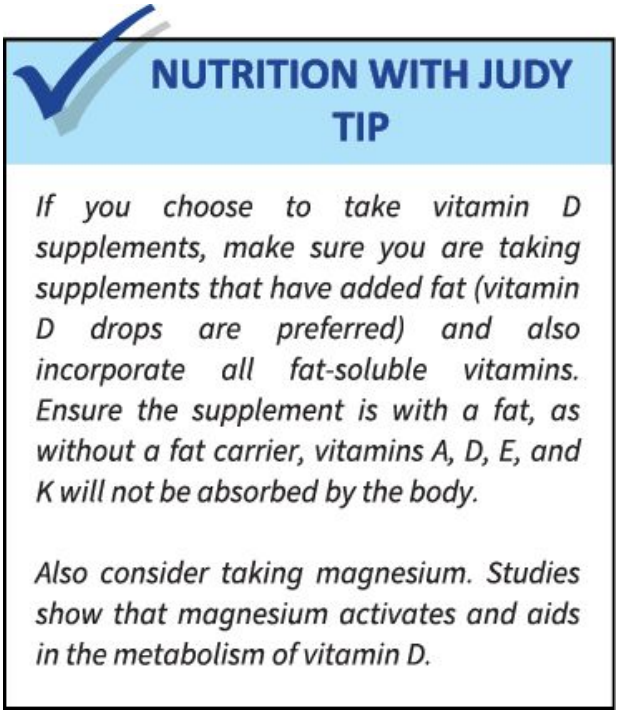
Studies show that you can get 10,000 to 15,000 International Units (IU) of vitamin D with natural sun exposure on summer afternoons. The current guideline for vitamin D is 300 to 400 IU daily. You can match this amount of natural sun exposure, by supplementing 3,000 to 4,000 IU daily.[241] According to the National Institutes of Health Office of Dietary Supplements, having sun exposure for about 5 to 30 minutes between 10 a.m. and 3 p.m. at least twice a week, without sunscreen, is sufficient for vitamin D synthesis.[242]

Standard daily recommendations consider blood serum vitamin D levels of 25 to 70 ng/ml (< 75 nmol/L) as normal ranges. Many

functional medicine providers consider 40 to 100 ng/mL (120 to 250 nmol/L) as targeted ranges and 70 to 100 ng/mL (175 to 250 nmol/L) as therapeutic ranges.

Many practitioners treat vitamin D-linked disorders such as cancer, diabetes, and heart disease with vitamin D. Sufficient vitamin D has shown to inhibit the onset and spread of several diseases. This may be due to vitamin D having influence over 2,000 genes in the body.[243]

It seems like a no-brainer to supplement with vitamin D. Right?



Studies have also shown the not-so-ideal consequences of supplementing with vitamin D. Some studies show that supplementing vitamin D to ideal ranges does not stop bones from breaking. Both the activated form of vitamin A and vitamin D are hormones. Hormones are chemicals that perform various cell signaling functions. Many studies show that vitamin A promotes bone resorption—the breakdown of bones and allows for more calcium in the blood—and vitamin D inhibits bone resorption. But

there are also studies that show the opposite to hold true. Yes, there are studies that support both sides.[244] There is no one answer that has proven to hold true for every single vitamin D-related study. There are just too many confounding factors.

There are studies where birds given toxic or deficient levels of vitamin A had similar retardations and bone health issues. Yet when given both toxic levels of vitamins A and D, the toxic effects did not occur. Why this happens is still unclear.[245]

Estrogen and other sex hormones also play similar roles to vitamin D. Estrogen inhibits bone resorption, and both estrogen and other sex hormones increase intestinal absorption and retention of calcium.[246] Can the lack of sex hormones exacerbate vitamin D deficiencies and then make vitamin A more toxic? We don't know with absolute certainty.

Whether it's not enough of the right balance of fat-soluble vitamins, minerals or sex hormones, the truth is that studies have shown a little bit of everything and are considered inconclusive.

Should we supplement vitamin D? We just don't know.

The truth is that we understand very little about how the body utilizes nutrients.

What all these studies do show, is the criticality of a nutrient-dense diet where nutrients are balanced naturally. A food-first approach should always take priority. It's risky to try to balance fat-soluble vitamins when we don't fully understand how they all work together. When we tinker with one nutrient, we are not considering the interaction with other nutrients and hormones. The fat-soluble vitamins work together synergistically to support the body's processes, including the balance of calcium in the body.

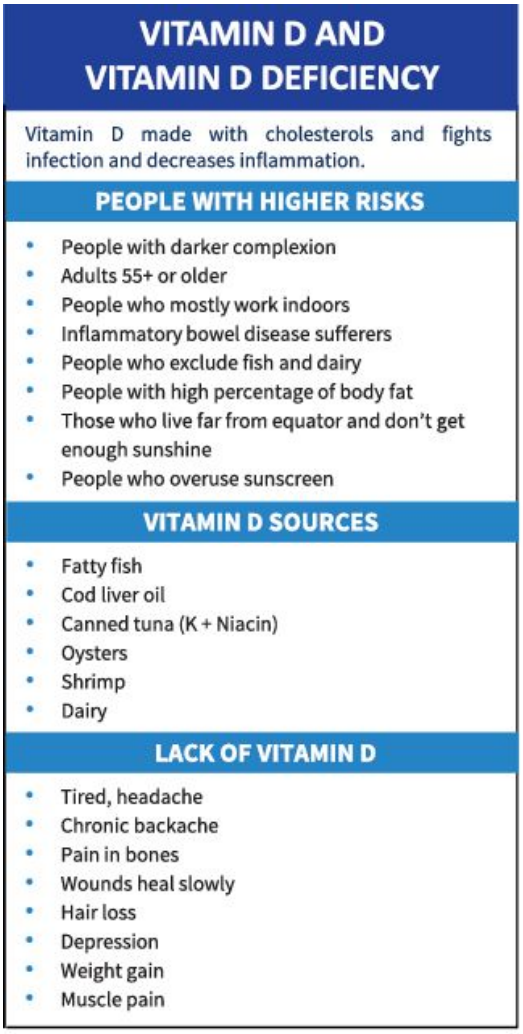


Table 11.5. Vitamin D and Vitamin D Deficiency.

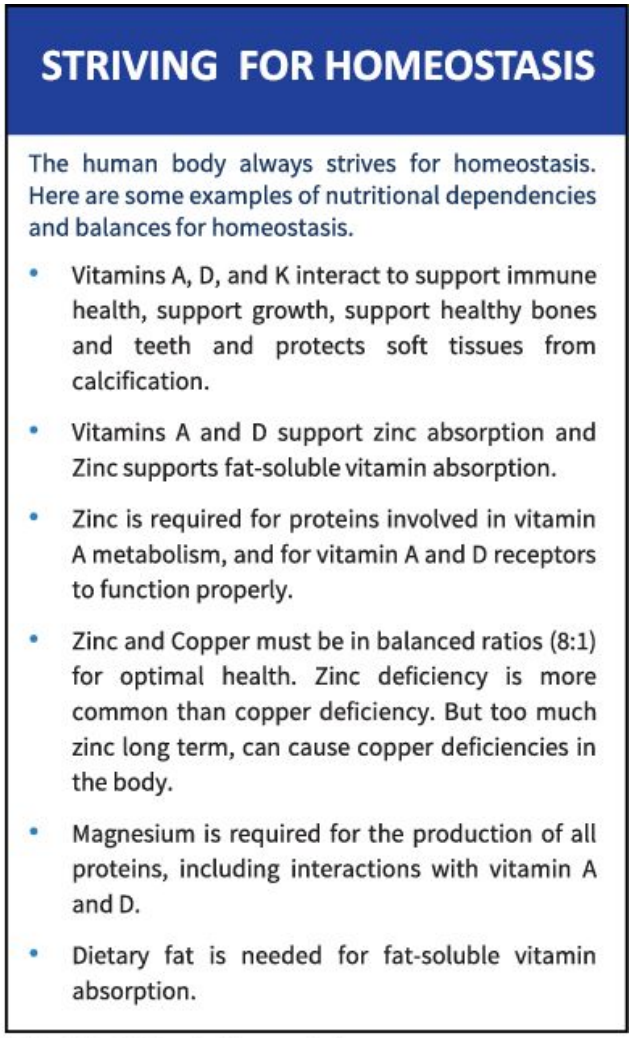
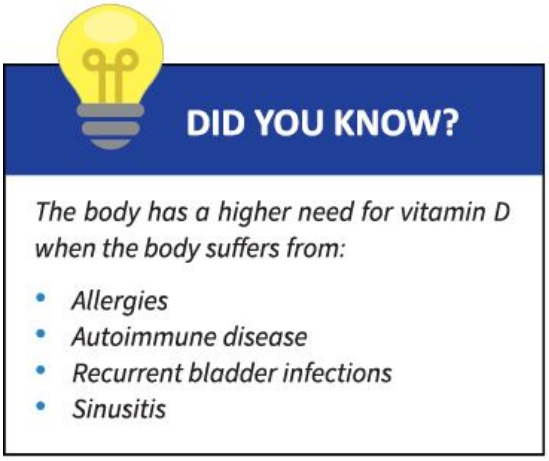


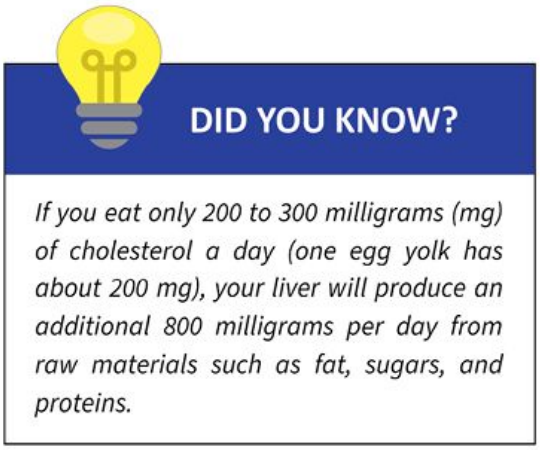
Table 11.6. Striving for Homeostasis.

Vitamin D, Tanning Beds and Ultraviolet Light

More research is coming out about the benefits of tanning beds, even amidst the risks of tanning beds causing potential risks of melanoma and premature aging.[247]

Tanning beds may mimic wavelengths proportions from the sun (95 percent UVA and 5 percent UVB). Supplemental vitamin D does not replace the ultraviolet light from the sun and may take months before noticeable changes are seen in the blood. Tanning beds can show immediate results. If you are very deficient in vitamin D, tanning beds may be a short-term solution. The key is to find tanning beds with the lowest radiation.





Cholesterol

Remember, as of 2015, there is no longer an upper limit from the USDA for cholesterol and dietary fat. Heart disease was rare before the 20th century. Major medical textbooks did not include coronary heart disease. Yet today, an estimated 17 million people around the world die from cardiovascular heart disease every year.

The body requires cholesterol. Remember, 25 percent of all cholesterol is in the brain, making the brain 60 percent fat. If the body has too little cholesterol, it will die. More than 80 percent of the cholesterol in the body is made by the liver and not from food consumed.[248]

Twenty-five percent of the body's cholesterol is in the brain, and about 70 percent is in the outer coating of our nerves.

What is Cholesterol?

Cholesterol is made by the liver and also made by almost every cell in the body. Cholesterol's role is to essentially make cells waterproof so that there is a protective barrier between the inside and outside of a cell. That means that every single cell in our body has cholesterol as part of its cell wall.

Understanding Lipoproteins, Fats and Cholesterol

Lipoproteins are carriage systems that determine what kind of fat (HDL, LDL) and how these carriages will move throughout the body. Lipids are fatty acids, triglycerides, and cholesterol.

Think of lipoproteins as fat-carrying boats. Triglycerides, cholesterol, and fat-soluble vitamins repel water, so they need lipoprotein boats to carry them throughout the body. The liver has receptors in the blood to determine how much cholesterol to circulate. If the liver is not functioning optimally, it will compromise cholesterol function.

The body needs cholesterol to support muscle repair and other cell functions. This is why when there is cardiovascular disease, we see increased amounts of cholesterol in the area. Cholesterol is not there causing the trouble, but the fat-carrying boat was docked there for cholesterol and other nutrients to help combat the trouble.[249]

Plaque is the body's attempt to deal with an injury inside the blood vessels. Let's take the heart as an example. Initially, the plaque helps the blood vessels remain strong, and it helps the vessels keep their shape. But with the perpetual cycle of out-of-control inflammation and leftover debris from cell repair (cholesterol), over time the plaque begins to grow and harden and reduce blood flow and oxygen to the heart. Both inflammation and repair need plentiful amounts of cholesterol and fats. So the body keeps sending these fat-substances to the site of plaque—until either the repair wins (the plaque becomes sclerotic scars on the heart muscle, causing heart failure) or inflammation wins (atherosclerosis heart attack).[250]

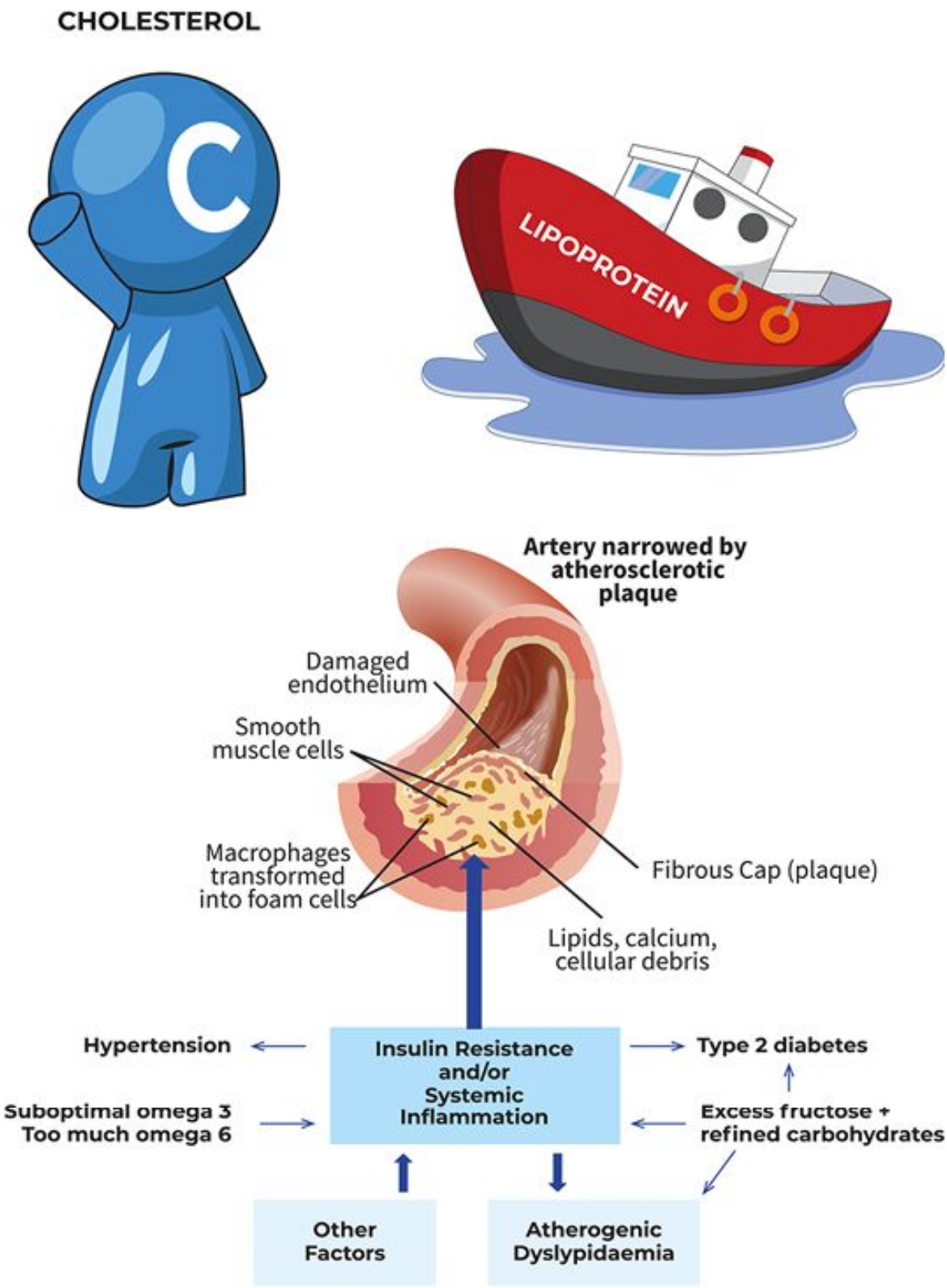


Figure 11.7. Cholesterol, Lipoproteins and Atherosclerotic Plaque.

Good dietary fats and cholesterol do not cause atherosclerosis. It is caused by chronic, out of control inflammation from metabolic syndrome (blood sugar imbalances and an excess of circulating insulin) from the foods we eat and the lifestyles we live. Toxic vegetable oils, processed foods, poor gut health, prescription drugs and pesticides, contaminated waters, nutrient deficiencies, and chemicals in our personal and home care products are just some of the factors that cause systemic inflammation in the body.[251]

THE MANY ROLES OF CHOLESTEROL	
1 Cell membrane	• Cell membrane is an 8-nanometer-thick gate where information, nutrients and cellular messengers are trafficked through protein gates supported by phospholipids and their polyunsaturated fatty acids. Cholesterol and saturated fat provide essential rigidity in balance with other membrane components. Cholesterol is an essential fuel for neurons.
2 Hormones	• Cholesterol is a precursor to vital sex hormones and steroids. Hormones and neurons are made of cholesterol and saturated fat. Without these building blocks the body becomes infertile, becomes amenorrheic, loses muscle mass, lose ability to think coherently and has a difficult time creating insulin. • The body recruits cholesterol to produce pregnenolone, a molecule that a precursor to sex hormones. • After the brain, the endocrine glands (adrenals and hormones) have the highest demand for cholesterol. Without cholesterol we would not be able to reproduce, as every single sex hormone is made up of cholesterol. In fact, some research has shown that women eating full-fat dairy may be able to cure infertility. • Our stress hormones are made out of cholesterol. Stressful situations increase our blood cholesterol levels because cholesterol is being sent to the adrenal glands for stress hormone production. This is likely why less fasting is recommended before getting bloodwork, as fasting can cause a stress response in the body. **TIP:** If you think you have an adrenal imbalance, lower your stress and eat good doses of dietary cholesterol.
3 Healing	• Cholesterol repairs wounds, including tears in the arteries. When the body has healing to do, it produces cholesterol and sends it to the site of damage.
4 Immunity	• Cholesterol is essential for a properly functioning immune system. LDL binds and inactivates bacterial toxins, preventing damage to the body. A hospital infection, MRSA, dissolves red blood cells but does not work in the presence of LDL cholesterol. Most older hospital patients are prescribed statins and while it lowers cholesterol, it makes them susceptible to MRSA. • People with high cholesterol are less likely to get the cold and also recover from infections faster than people with normal or low blood cholesterols.
5 Vitamin D	• Cholesterol is a precursor to vitamin D and is needed for strong bones, calcium metabolism, eye health, reproduction and the nervous system. • Vitamin D is produced from cholesterol precursors. The body makes vitamin D from cholesterol in the skin upon exposure to UV rays from the sun.
6 Bile salts	• Cholesterol is a precursor to bile salts. Proper fat digestion and proper liver functioning is required for this to happen. • Cholesterol also supports the production of bile acid, which is integral to the breakdown and absorption of essential dietary fats. Bile is required to absorb fats and fat-soluble vitamins. 95% of our bile is recycled because the building blocks of bile is too costly for the body to waste.
7 Antioxidants	• Cholesterol is a powerful antioxidant that protects against free radicals.
8 Brain and nervous system	• Cholesterol is essential for the development and function of the brain and nervous system and for proper functioning of serotonin receptors in the brain.

Table 11.8. The Many Roles of Cholesterol.

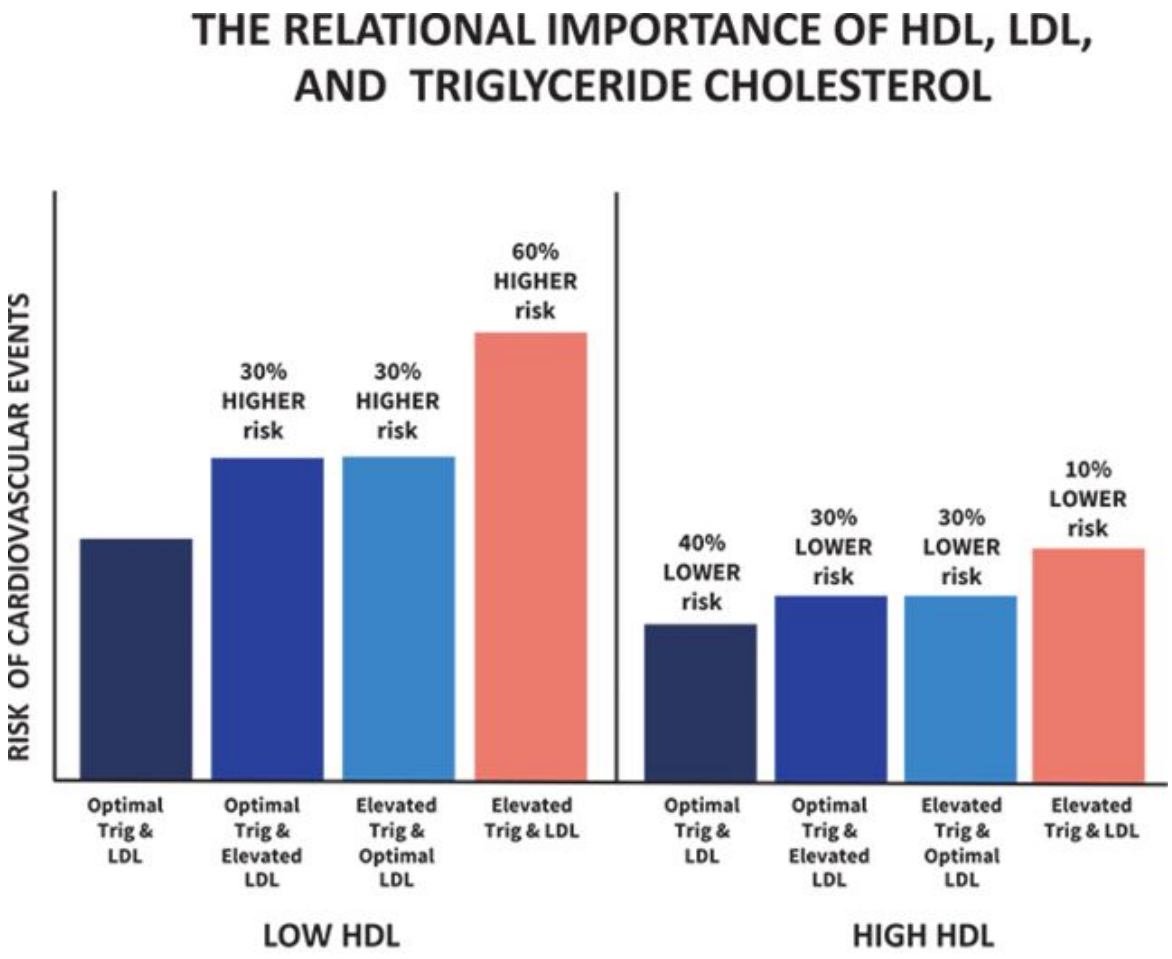


Figure 11.9. Gordon, T. et al., "The Framingham Study," *Journal of Medicine*, 62(5), (1977). 707-714.

Framingham Heart Study

The Framingham studies, established in 1948, is the longest-running, multi-generational longitudinal study in medical history, now in its 6th decade and including over 14,000 participants.[252]

In Figure 11.9, based on various combinations of HDL, LDL and triglycerides in 3,590 men and women, they found no statistically significant risk of heart disease with high LDL alone. HDL matters significantly here. This is becoming more accepted by conventional medicine as some now look at cholesterol from an LDL particle lens, and cholesterol markers from a total cholesterol ratio-perspective. Table 11.10 shares cholesterol ratio ranges, and Figure 11.11 takes a closer look at LDL particle size.[253]

CHOLESTEROL RATIO RANGES				
RISK LEVEL		**OPTIMAL**	**MODERATE**	**HIGH**
Total / HDL ratio	Men	< 3.5	3.5 – 5.0	> 5.0
	Women	< 3.0	3.0 – 4.4	> 4.4
LDL to HDL ratio		< 2.5	2.5 – 3.3	> 3.3
HDL to LDL ratio		>0.04	0.4 – 0.3	< 0.3
TG to HDL ratio		< 2	2.0 – 3.8	> 3.8

Table 11.10. Cholesterol Ratio Ranges.

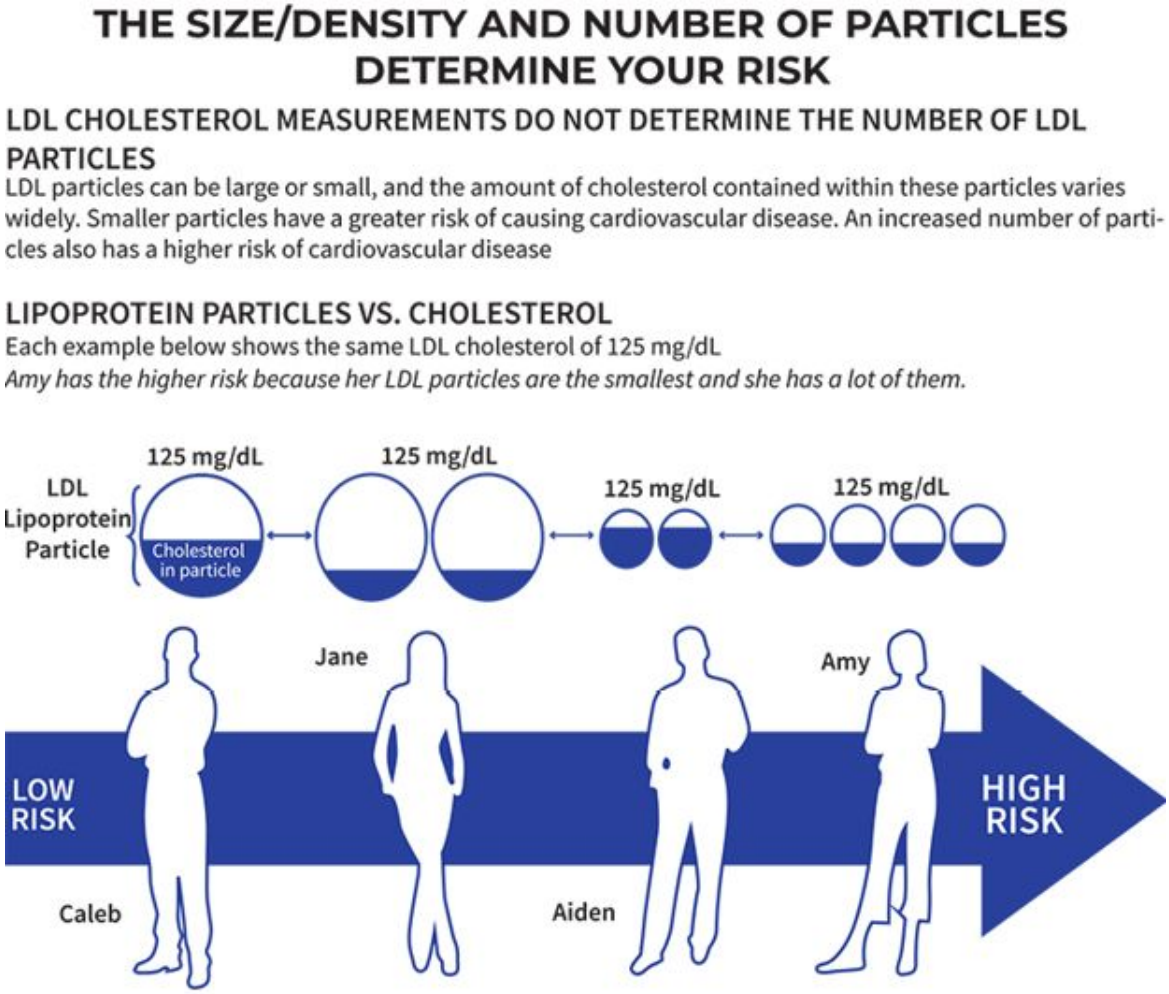
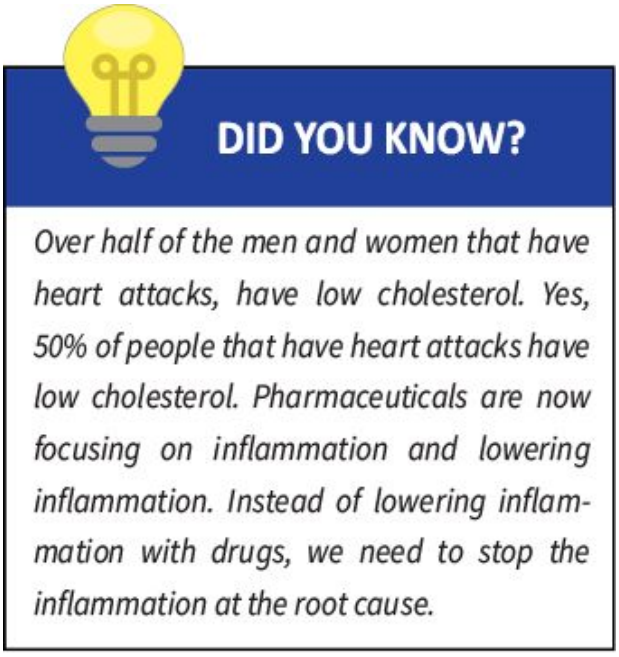


Figure 11.11. Risk Based on Size, Density and Particle Count.

One cholesterol marker to focus on is triglycerides. Triglycerides are the fats that are floating around in the body to use as energy. More triglycerides circulate on higher carbohydrate diets. Triglycerides are usually a risk indicator of cardiovascular risk events. High triglycerides can contribute to the hardening of arteries and the thickening of the artery walls, which increases the risk of heart disease. Very high triglycerides can also cause acute inflammation in the pancreas.

Remember that high LDL markers do not matter in isolation. If LDL is high, but HDL is also high, the risk of cardiovascular events lessens. You never want a scenario where you have high triglycerides (>100 mg/dL) with high LDL (>180 mg/dL) and low HDL (<50 mg/dL). The conventional recommendations for triglycerides are under 150, but when you consume a low carbohydrate, high-fat diet, less than 100 mg/dL is optimal.



Statins

Remember, most of the cholesterol is made in the body—not by our foods. You also need cholesterol for every single cell of the body.

These factors can make cholesterol-lowering medicines (statins) have dangerous consequences. In fact, all prescription medications and drugs deplete nutrients in the body.

One side effect of cholesterol-lowering drugs is memory loss. Statin use has been linked to anger, suicide and depression. Remember, 25 percent of our total cholesterol is in the brain.[254]

Statins also reduce CoQ10 in the mitochondria by almost 50 percent. You need CoQ10 for energy production. Statins interfere with CoQ10, which supports muscle functioning. This is why another side effect of statins is muscle aches. Statins also cause damage to the gut ecosystem. If you are taking a statin, make sure to take a CoQ10 and spore probiotic supplement.

NUTRIENT DEPLETION FROM DRUGS AND MEDICATIONS

Every drug has a consequence. While a drug may temporarily help support a symptom, long term use can cause nutrient deficiencies. Per the Drug-Induced Nutrient Depletion handbook, the following nutrients are depleted when taking these types of drugs.

	TYPE OF DRUG	EXAMPLES	NUTRIENTS DEPLETED
1	Antacids	• Pepcid • Prevacid • Prilosec • Tagamet • Zantac • Prilosec • Tagamet • Zantac	• Calcium • Folate • Iron • Vitamin A • Vitamin B_{12} • Vitamin D • Zinc
2	Antibiotics	• General Aminoglycosides (Gentamycin, Neomycin, Streptomycin) • Cephalosporin • Penicillin	• B vitamins • Vitamin K • Friendly beneficial intestinal bacteria
		• Tetracyclines	• Calcium • Magnesium • Iron • Vitamin B_6 • Zinc
3	Anti-depressants	• Adapin • Aventyl • Elavil • Tofranil • Pamelor • Sinequan • Norpramin	• Vitamin B_{12} • Coenzyme Q10
4	Anti-histamine	• Diphenhydramine • Coricidin	• Vitamin C
5	Caffeine	• Coffee • Tea • Energy drink	• Biotin • Inositol • Potassium • Vitamin B_1 • Zinc
6	Cardiovascular Drugs	• Betapace • Corgard • Inderal • Lopressor • Sectral • Tenormin	• Coenzyme Q10 • Melatonin • Vitamin B_6
7	Diuretics	• Bumex • Lasix • Edecrin	• Calcium • Coenzyme Q10 • Magnesium • Potassium • Sodium • Vitamin B_1 • Vitamin B_6 • Vitamin C
8	Cholesterol-Lowering Agents (Statins)	• Colestid • Questran	• Beta-Carotene • Folate • Iron • Vitamin A • Vitamin B_{12} • Vitamin D • Vitamin E • Vitamin K
		• Crestor • Lescol • Lipitor • Mevacor • Pravachol • Zocor	• Coenzyme Q10
9	HRT (Hormone Replacement Therapy)	• Evista • Estratab • Prempro • Premarin	• Folate • Magnesium • Vitamin B_2 • Vitamin B_6 • Vitamin B_{12} • Vitamin C • Zinc
10	Oral Contraceptives	• Norinyl • Ortho-novum • Triphasil	• Folate • Magnesium • Selenium • Vitamin B_2 • Vitamin B_3 • Vitamin B_6 • Vitamin B_{12} • Vitamin C • Zinc

Table 11.12. Nutrient Depletion from Drugs and Medications.

Inflammation in the body is associated with almost all modern diseases, but inflammation is a normal body function. The body needs to inflame and anti-inflame. It is part of the body's natural response to injury and infection, and critical for the healing process.

You need to inflame so that you rest the specific body part and allow the body to heal. Acute inflammation is a normal, healthy process of the body. But the body was never designed to handle chronic inflammation. Chronic inflammation begins to damage healthy cells, organs, and tissues. Figure 11.13 shares examples of chronic and acute inflammation.

ACUTE VS. CHRONIC INFLAMMATION

The body is designed to handle acute inflammation but not meant to deal with chronic inflammation. Acute inflammation is typically short-lived, the stimulus ends, and the body heals. Chronic inflammation is an ongoing stimulus that does not end, causing chronic inflammation in the body.

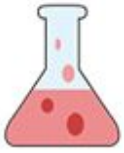
ACUTE INFLAMMATION	CHRONIC INFLAMMATION
• Allergic reactions 	• Autoimmune disease 
• Burns 	• Cancer 
• Chemical irritants 	• Cardiovascular disease 
• Cuts, lacerations 	• Chronic fatigue syndrome 
• Infection 	• Depression 
• Trauma injury 	• Neurological disease 

Figure 11.13. Acute vs. Chronic Inflammation.

Most doctors receive an industry payout for prescribing brand name drugs and devices. A Harvard study shows that doctors that get these payouts are five percent more likely to prescribe these drugs.[255] The top three highest-paid doctors in 2018 made over $75M from pharmaceutical and device company payouts alone. You can check to see if your doctor received any drug or device company money in 2018 at Dollars for Docs (Figure 11.14). You can also search a 2009-2013 database that has 3.5 million records of 17 pharmaceutical companies, disclosing payouts of $4 billion to doctors and hospitals.[256]

Figure 11.14. Dollars for Docs. https://projects.propublica.org/docdollars/

Statins are the most prescribed medication in the world and a billion-dollar business. As if they haven't made enough money,

pharmaceutical companies are now working on cholesterol-reducing medications for children.[257]

Magnesium (and Potassium)

Magnesium is required for over 600 reactions in the body. In fact, every cell in the body needs magnesium. Magnesium is a naturally occurring mineral that is important for the muscles and nerves. Fifty percent of the U.S. population is magnesium deficient and as high as 80 percent if you consider the western population.[258]

VITAMIN D AND MAGNESIUM

If you supplement with vitamin D, consider taking magnesium:

- Studies show that magnesium activates and aids in the metabolism of vitamin D.
- Without magnesium, vitamin D may not get absorbed. Magnesium activates enzymes, including those that play a role in vitamin D metabolism.
- One study showed that people with high levels of magnesium had fewer tendencies of having lower vitamin D levels. People that get sufficient magnesium may require fewer levels of vitamin D supplementation.
- Other studies have shown that individuals with higher magnesium levels also had higher bone mineral density. Essentially, low levels of magnesium levels make vitamin D ineffective.

Table 11.15. American Osteopathic Assoc, "Low Magnesium Levels Make Vitamin D Ineffective," *Science Daily*, (2018).

BENEFITS OF MAGNESIUM

Involved in hundreds of biochemical reactions in your body, such as:

- *Energy creation:* helps convert food into energy
- *Protein formation:* helps create new proteins from amino acids
- *Gene maintenance:* helps create/repair DNA and RNA
- *Muscle movements:* supports the contraction and relaxation of muscles
- *Nervous system regulation:* helps regulate neurotransmitters, which send messages throughout your brain and nervous system

Magnesium may boost exercise performance

- During exercise, you may need 10–20% more magnesium than when you're resting.
- Magnesium helps move blood sugar into your muscles and dispose of lactate, which can build up in muscles during exercise and cause pain.

Magnesium has been shown to:

- Fight depression
- Show benefits against type 2 diabetes
- Lower blood pressure
- Have anti-inflammatory benefits
- Help prevent migraines
- Reduce insulin resistance
- Improve PMS symptoms

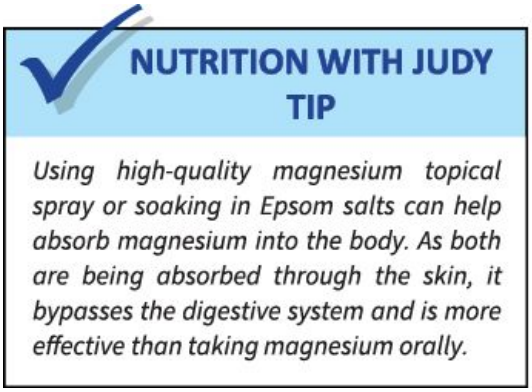
Table 11.16. Benefits of Magnesium.

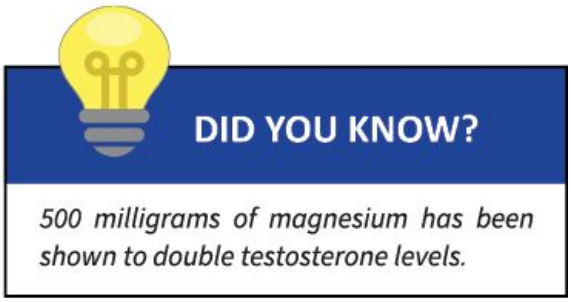
Magnesium is one of the main electrolytes needed when following a low carbohydrate diet. Remember, you need magnesium to assimilate vitamin D properly. You also need magnesium to have

potassium, and calcium ions travel across membranes. Many foods that contain potassium also contain magnesium (avocado). It is nature's way of striving for homeostasis because low levels of magnesium can cause low levels of potassium. This is why supplementing potassium—when you are, in fact, deficient in magnesium—is futile.

When my client shows signs of low electrolytes, I have them try salt first, then some topical magnesium spray, but rarely ever potassium.

If you take laxatives and diuretics to help with bowel movements or to lower blood pressure, switch to a potassium-sparing option. Potassium is essential for nerve and muscle communication. When you sweat, consume laxatives, or take antibiotics, you lose potassium in the body, as potassium helps clear cell waste and allows for nutrient absorption.





One of the symptoms of magnesium deficiency is an irregular heartbeat or heart arrhythmia. This can even lead to stroke and heart disease. When magnesium levels are low in the body, calcium can overstimulate the heart muscles. With enough magnesium in the body, magnesium helps heart muscles relax by countering calcium. The muscles need calcium to contract and require magnesium to relax. This is another reason why I'm a fan of using topical magnesium spray before bed.[259]

Our foods are becoming magnesium-deficient as our topsoils are depleted of nutrients. With high amounts of glucose, any remaining magnesium gets depleted. It is nearly impossible to correct low levels of magnesium without removing processed carbohydrates. Remember, a deficiency in magnesium may be the cause of low vitamin D levels.

Blood sugar dysregulation is a significant contributor to magnesium deficiency. To metabolize one molecule of glucose (sugar), you need twenty-eight molecules of magnesium. You need fifty-six molecules of magnesium to metabolize one molecule of fructose (honey, fruit, high fructose corn syrup). Our modern lifestyle is filled with man-made toxins. The body has elaborate detoxification pathways, but every detoxification pathway in the body requires magnesium.[260]

Although dark chocolate is touted to be a great source of magnesium, most dark chocolates also have a substantial amount of sugar. The magnesium will be used up to metabolize the glucose from the dark chocolate, and the benefits of magnesium may be canceled out. We also need to consider oxalates and other antinutrients. If you consume dark chocolate with almonds, you are consuming a toxic load of oxalates and most likely binding most of your minerals from absorption. Consume the meats in Table 11.19 instead.

TYPES OF MAGNESIUM

TYPE	ABSORPTION	BENEFITS
Magnesium citrate	• Good	• Constipation support • Kidney stone support
Magnesium glycinate	• Good	• Anxiety support • Pain support • Sleep support
Magnesium L-threonate	• Good	• Cognitive function and memory support
Magnesium malate	• Good	• Fibromyalgia support • Muscle fatigue support
Magnesium orotate	• Good	• Heart health support
Magnesium oxide	• Poor	• Laxative for constipation
Magnesium sulfate	• Transdermal • IV	• Epsom salts • Detox support • Muscle joint pain support
Magnesium taurate	• Good	• Heart health support • Blood sugar balance support
Magnesium threonate	• Good	• Brain health support • Mood disorder support
Magnesium oxide	• Poor	• Laxative for constipation

Table 11.17. Types of Magnesium.

SIGNS OF MAGNESIUM DEFICIENCY

Some health conditions that occur when the body is magnesium deficient:

- We get high blood pressure because our arterial muscles cannot relax.
- We get backaches and neck pains because our muscles that support our spine go into a spasm.
- We get cramps and eclampsia during pregnancy.
- We get irregular heartbeats (arrhythmia) and sudden heart pains (angina pectoris).
- Magnesium deficiency is also the cause of sudden cardiac death because the coronary arteries go into a spasm. Same goes for transient strokes in the brain (brain arteries going into a spasm).
- Constant imbalance of other minerals in the body: copper, iron, manganese, molybdenum, potassium and zinc .
- Low potassium is nearly impossible to correct if a person is magnesium deficient.
- Stimulates the release of histamines from cells. The person becomes more prone to allergies and skin conditions, like eczema.
- Psychiatric symptoms such as anxiety, confusion, depression, panic attacks, poor memory and other neurological issues.

Table 11.18. Signs of Magnesium Deficiency.

ANIMAL-BASED FOODS HIGH IN MAGNESIUM

The following foods have some of the highest amounts of magnesium per 100 g serving. (USDA)

FOOD	AMOUNT PER 100 G	
Snail	• 250 mg	
Anchovy, canned	• 69 mg	
Scallop, raw	• 56 mg	
Yellowfin tuna, raw	• 50 mg	
Oyster, Eastern, raw	• 47 mg	
Crab, Dungeness	• 45 mg	
Sardines, canned	• 39 mg	
Salmon, raw	• 31 mg	
Lobster	• 27 mg	
Pork chops, raw	• 25 mg	
Lamb leg, raw	• 23 mg	
Grass-fed beef, raw	• 23 mg	
Beef heart, raw	• 21 mg	
Chicken, dark, raw	• 21 mg	
Pork ribs, raw	• 21 mg	
Venison, raw	• 21 mg	
Beef chuck roast, raw	• 19 mg	
Chicken liver, raw	• 19 mg	

Table 11.19. Animal-Based Foods High in Magnesium.

Vitamin C

Vitamin C comes in two different forms. Ascorbic acid is the antioxidant form and is transported through the gut epithelial cells to tissues and sodium-dependent vitamin C transporters.

The other form of vitamin C is the dehydroascorbic acid, and this is transported through glucose transporters. Red blood cells use these transporters for vitamin C, and these transporters also compete with glucose for uptake. The dehydroascorbic acid is reduced to ascorbic acid in the body, and it may be one reason why a meat-based diet has a reduced vitamin C needs—there is no glucose to compete for absorption.

When you have too much sugar in the blood, studies have shown that vitamin C gets excluded from the cells. This results in a decreased antioxidant capacity in the cells that are vitamin C-dependent.[261]

As with much of nutrition, there are a lot of unknowns. Why does vitamin C have different transporters, and why does it vacillate between the dehydroascorbic acid and the antioxidant form, ascorbic acid?

Studies have shown that some forms of vitamin C are more readily available for the body and even higher in immune cells (leukocytes). Other studies show that genetics matter. We monitor vitamin C status through the blood, but some studies have shown that vitamin C in tissues may be more accurate indicators of vitamin C concentrations in the body. But it's much harder to assess.[262]

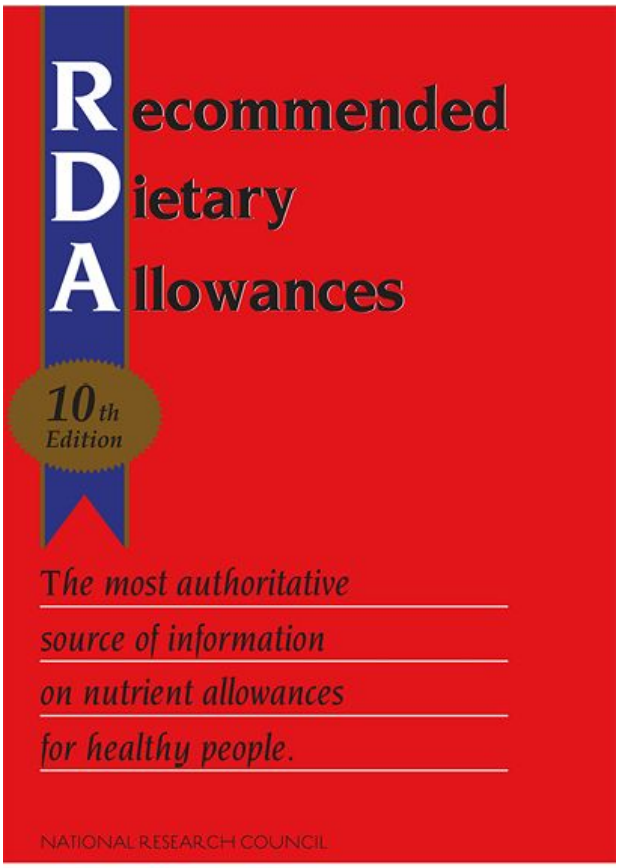


Figure 11.20. 10th Edition Cover. Recommended Dietary Allowances.

Scurvy is a disease from a lack of vitamin C. It is estimated that scurvy shows up within one month of having little or no vitamin C. Signs of scurvy include fatigue, general malaise, and inflammation in the gums. In the mid-19th century, 50 percent of sailors died from scurvy, totaling more than two million sailors. But even in the sailor population, 50 percent of the sailors never showed signs of scurvy, even when eating the same foods as the sailors who died of scurvy.[263]

Genetics plays a role in vitamin C needs. The half-life of vitamin C's storing and usage also varies by individual. If bio-individuality matters, why do we place so much value in the recommended daily allowances?

Conventional dietary advice says that vitamin C deficiency and scurvy only occurs if vitamin C intake is lower than 10 mg/day for several weeks. While organ meats, salmon, and pork belly have vitamin C, many carnivore diet advocates only consume steaks and ground beef. It is nearly impossible to obtain 10 mg/day of vitamin C from these meats alone. Yet scurvy has not been reported by even 1% of the carnivore diet community.[264]

In principle, recommended daily allowances are based on various kinds of evidence:

1. “Studies of subjects maintained on diets containing low or deficient levels of a nutrient, followed by correction of the deficit with measured amounts of the nutrient.
2. Nutrient balance studies that measure nutrient status in relation to intake.
3. Biochemical measurements of tissue saturation or adequacy of molecular function in relation to nutrient intake.
4. Nutrient intakes of fully breast-fed infants and of apparently healthy people from their food supply.
5. Epidemiological observations of nutrient status in populations in relation to intake.
6. In some cases, extrapolation of data from animal experiments. In practice, there are only limited data on which estimates of nutrient requirements can be based.” (RDA, 10th ed, 1989)[265]

In 2000 and 2001, vitamin C’s recommended daily allowance increased to 90 milligrams for men and 70 milligrams for women. These increases were based on depletion and repletion studies for vitamin C. Depletion and repletion studies analyze the loss of a

specific nutrient before the participant becomes ill (depletion) and then determines at what set point the nutrient is back in normal range (repletion).[266]

In the case of vitamin C, in 2000 and 2001, the recommended daily allowance for vitamin C effectively doubled. Why were the vitamin C RDA levels wrong in both 1974 and in 1989? In fact, every 10 to 15 years, there has been a large increase in the recommended daily allowances for vitamin C (reference Table 11.21). How do we know that 90 milligrams is sufficient?

Remember from Chapter 5, Monsanto introduce glyphosate in 1974. Interestingly, also in 1974, prices of sugar became too high that high fructose corn syrup was introduced to the U.S. market. Could the increase in readily available glucose foods and high fructose corn syrup foods be a reason we require more vitamin C? Are the glucose transporters taking up more glucose and less vitamin C?[267]

OFFICIAL RDA FOR VITAMIN C (1974 – 2000)

YEAR	RDA EDITION PUBLICATION	VITAMIN C RDA FOR HEALTHY ADULT MALE
1974	• 8th edition	• 45 mg
1980	• 9th edition	• 45 mg
1989	• 10th edition	• 60 mg
2000	• DRI for vitamin C, vitamin E, selenium and carotenoids	• 90 mg

Table 11.21. National Academies Press, "Dietary Reference Intakes for Vitamin C ... " (2000).

NUTRITION WITH JUDY TIP

Too much ascorbic acid or Vitamin C can also increase the production of oxalates. If you want to supplement, take no more than 500 mg at one time and opt for a time-released vitamin C supplement version.

Magnesium glycinate can exacerbate oxalate sensitivity and oxalate dumping.

Always work with your practitioner for individualized care.

Yes, correlation is not causation. But as vitamin C supports immune function and mediates immune response against infection

organisms, I wonder how much high carbohydrate diets affect our vitamin C need.

Consumption of refined sugar reduces white blood cell function.[268] Remember, white blood cells make up the immune system, and 70 to 80 percent reside in the gut. Studies show that a high sugar diet abnormally impacts the innate immune system, which includes increased inflammation.[269]

Our adrenals produce hormones like cortisol (stress hormone) to manage insulin and blood sugar levels. Cortisol requires significant use of B vitamins. B vitamins also help to prevent infection and support overall cell health. When cortisol depletes the body's store of B vitamins, the immune system is left to fend for itself.

Lowering sugar consumption will require less cortisol production. If the body is stressed and sleep-deprived, cortisol will continue to release. A high sugar diet and a stressful lifestyle overtax the adrenals that make cortisol. One nutrient that supports hyperfunctioning adrenals is vitamin C.

Adrenal imbalances are supported by vitamin C (as well as taurine and salt). What if vitamin C needs have increased because of the confounding factors of a high sugar diet, a stressful and sleep-deprived lifestyle, and overall adrenal imbalances?

What happens when you remove carbohydrates in the diet? What happens to the vitamin C need then?

ANIMAL-BASED FOODS HIGH IN VITAMIN C

These animal-based foods have some of the highest amounts of vitamin C per 100 g serving. (USDA)

FOOD	AMOUNT PER 100 G	
Beef spleen, raw	• 45.5 mg	
Beef thymus, raw	• 34 mg	
Pork liver, raw	• 25.3 mg	
Chicken liver, raw	• 17.9 mg	
Salmon roe, cured	• 16 mg	
Chicken giblets, raw	• 13.1 mg	
Lamb kidney, raw	• 11 mg	
Cuttlefish, raw	• 5.3 mg	
Goose meat, raw	• 4.2 mg	
Squid, raw	• 4 mg	
Oyster, raw	• 3.7 mg	
Crab, Dungeness	• 3.5 mg	
Scallop, raw	• 3 mg	
Duck meat, raw	• 2.8 mg	
Beef liver, raw	• 1.3 mg	

Table 11.22. Animal-Based Foods High in Vitamin C.

SHOULD YOU SUPPLEMENT VITAMIN C?

NEED FOR VITAMIN C	POINTS TO CONSIDER BEFORE SUPPLEMENTING
Important cofactor, needed for making collagen	• Bone broth is a source of gelatin that breaks down into collagen in the body. • The best proven collagen oil is consuming avocado oil. • Red light therapy combined red and infrared rays to stimulate blood circulation and boosts your collagen production without UV rays. • A 2014 study found that some collagen peptide powders work to have better skin.
Turning dopamine into norepinephrine	• Caffeine can release norepinephrine. • Meat, fish, eggs and cheese are high in phenylalanine and tyrosine which are precursors to norepinephrine. • Exercise and cold temperature has shown to turnover norepinephrine in humans.
Plays a role in making carnitine (fatty acids for energy)	• Although there are potential deficiencies from carnitine, in the last 40 years, only two examples of disorders from carnitine deficiency were healed with carnitine treatment.
It's an antioxidant, limiting damaging effects of free radicals as an antioxidant	• What if there are less free radicals from a grain-free, sugar-free, inflammatory seed oil-free diet?
Plays an important role in neutrophils (for immune cells) and in cell integrity	• Many nutrients play a large part in cell integrity. Fasting can help with apoptosis and autophagy. A meat-based diet is known to be a fast mimicking diet.
Improves absorption of nonheme iron	• Negligible with heme iron from plentiful meats.

Table 11.23. Should you Supplement Vitamin C?

In 2001, the National Health and Nutrition Examination Survey did not include data for breast-fed infants and toddlers—even though breast milk has adequate amounts of vitamin C. We consider breast milk to be a complete food. Remember, breast milk is the gold standard for amino acid balances.

Breast milk has nowhere near the 45 milligrams (children's requirement for vitamin C), 70 milligrams (for women), or 90 milligrams (for men) of vitamin C. I have not heard of any breastfed baby having scurvy.

High vitamin C consumption can increase urinary oxalate acids and the excretion of uric acid, causing kidney stones. One of the metabolites of vitamin C is oxalic acid. If the body chooses to have ascorbic acid go down the oxalic pathway, you will have more oxalates.[270] As vitamin C supports the absorption of nonheme iron in plants, excess iron absorption can also occur. The excess iron results can cause tissue damage.[271]

While vitamin C is known for its antioxidant benefits, vitamin C can also act like a pro-oxidant, causing more oxidative damage. More oxidation means more inflammation in the body. Vitamin C supplements can cause DNA damage and may even contribute to cancer. Other studies have shown that high vitamin C consumption can reduce vitamin B12 and copper, cause quicker excretion of vitamin C, and produce allergic reactions.[272]

If you choose to supplement with vitamin C, the best option is to supplement with small doses throughout the day rather than taking a 1,000 mg supplement once a day. You can also consume more of the foods in Table 11.22.

Antioxidants

The body makes antioxidants, but many occur naturally in foods. Antioxidants are rich in plant foods, but antioxidants also occur in animal foods. Selenium is an example of an antioxidant. It is rich in ribeye steaks, salmon, chicken, pork belly, and eggs. The key benefit of antioxidants is the ability to inhibit oxidation. Oxidation is a

chemical reaction that produces free radicals that can damage cells by oxidative stress. Antioxidants support cells by preventing or delaying some types of cell damage.

ANTIOXIDANTS IN ANIMAL-BASED FOODS

The following animal-based foods have some of the highest amounts of antioxidants per 100 g serving.

ANTIOXIDANT	FOOD SOURCES
3,5-Dihydroxy-4-methoxybenzyl	• Oysters
Astaxanthin	• Salmon • Salmon roe
Vitamin B_2 (Riboflavin) meats	*Acts like an antioxidant* • Pork liver • 3 mg • Beef liver • 2.8 mg • Chicken liver • 2.3 mg • Salmon roe • 0.8 mg • Beef skirt steak • 0.7 mg • Turkey, dark • 0.6 mg • Eggs • 0.5 mg • Pork shoulder • 0.5 mg
Carnosine	• Horse meat • 533 mg • Pork loin • 466 mg • Beef shin • 396 mg • Angus beef • 353 mg • Chicken breast • 290 mg • Chicken leg • 124 mg • Lamb leg • 111 mg
Manganese	*Has antioxidant capabilities* • Mollusks • 3.4 mg • Oysters • 0.6 mg • Clam • 0.5 mg • Beef, Chicken liver • 0.3 mg • Pork liver • 0.3 mg • Trout • 0.2 mg
Selenium	*Acts like an antioxidant* • Pork kidney • 190 mcg • Beef kidney • 141 mcg • Tuna, light, canned • 80.4 mcg • Oyster • 77 mcg • Anchovy, canned • 68.1 mcg • Chicken liver • 54.6 mcg • Sardine • 52.7 mcg
Taurine	*Acts like an antioxidant* • Crab, Dungeness • Eggs • Salmon • Dairy • Beef liver • Breast milk • Chicken, dark • Shellfish (shrimp, scallops, clams)

Table 11.24. Antioxidants in Animal-Based Foods.

Vitamin C, vitamin E, selenium and manganese are all naturally occurring antioxidants. These nutrients are in salmon, salmon roe

and pork belly. Salmon also contains the antioxidant astaxanthin (the red pigment). Astaxanthin works with omega-3s to protect the brain and nervous system from oxidation. Sockeye salmon has the most astaxanthin per ounce, compared to other salmons.[273] Remember, oysters also have antioxidants called 3,5-Dihydroxy-4-methoxybenzyl alcohol (DHMBA).[274]

High concentrations of antioxidants can be harmful. Recall that high concentrations of antioxidants may act as pro-oxidants, increase oxidation, and may even protect cancer cells.

Phytoestrogens (foods and toxins that mimic estrogen) can be harmful to our health. Phytoestrogens can adversely impact our hormonal health.

Phytoestrogens are considered antioxidants. A meta-analysis study found that beta-carotene supplements (an antioxidant in carrots) significantly raised the risk of mortality and slightly raised the risk of cardiovascular disease. Another study demonstrated the harm of consuming vitamin E (antioxidant), that daily doses above 150 IU increased the risk of death, and 50 to 400 daily IU increased the risk of hemorrhagic stroke.[275]

If we reduce most of the body's inflammation through diet, do we need significant amounts of antioxidants?

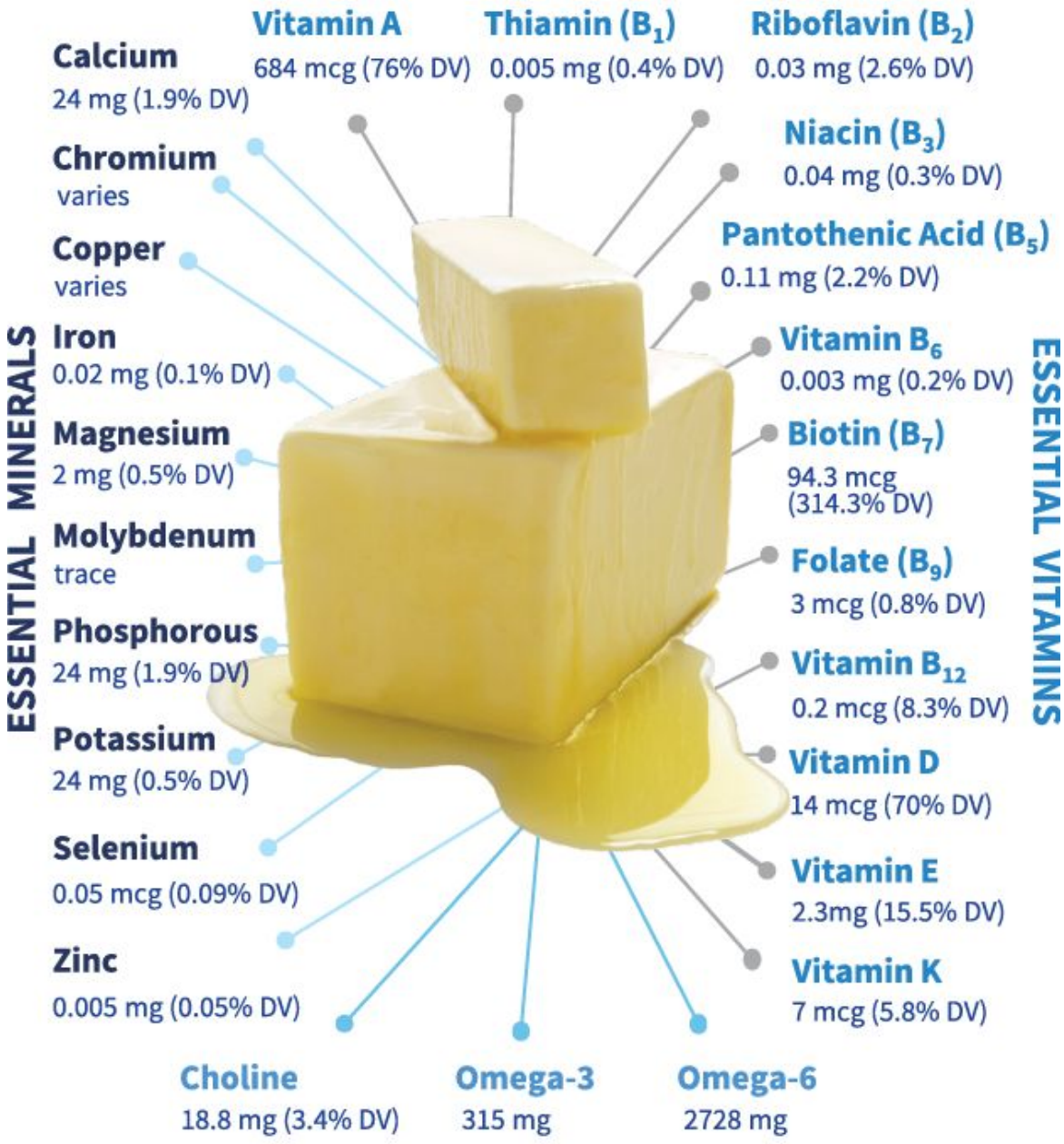
Fiber

Nutritional guidance recommends copious amounts of fiber in our diet. Fiber is broken down into short-chain fatty acids, such as butyrate (butyric acid), propionate (propionic acid), and acetate (acetic acid). Butyrate is essential because it is the preferred fuel source by the large intestine's endothelial cells.

Butter, cream, and cheese contain butyrate in its absorbable form. Butter is the best source of butyric acid or butyrate. In fact, the origins of the word butyric acid are from the Latin word, *butyrum*—the same origins of the word butter.[276]

BUTTER

per 100 gram serving
approx. 3.5 ounces



Per the USDA nutrition database, butter is missing Vitamin C (salmon, oysters, and pork belly), and Manganese (bone broth, egg).

Figure 11.25. Butter.

How did we come to think that butyric acid is best from plants?

The number one dietary source of butyrate is butter. According to a 2016 microbiome study, “Butter contains 3 to 4 percent of butyric acid, in the form of tributyrin (butyryl triglyceride), making it the richest dietary source of butyrate…”[277]

Butyrate is also made in small quantities in mammalian cells through the breakdown of fats and metabolism of glucose. Yes, butyrate can be found in animal fats and dairy.[278] Figure 11.26 has some animal-based butyrate food sources.[279]

The best source for acetate (another short-chain fatty acid) is vinegar. The best source of acetate is vinegar. If you are concerned about the lack of acetic acid in a meat-based diet, add a couple of drops of vinegar to water.

Some conventional nutritionists argue that a lot of butter is needed in order to get the same amounts of butyrate as from vegetables. But remember, short-chain fatty acids from plant foods need to be broken down for butyrate to be available for the body. What if you have poor functioning gut health? What if your large intestine isn’t able to break down these plant foods into butyrate?

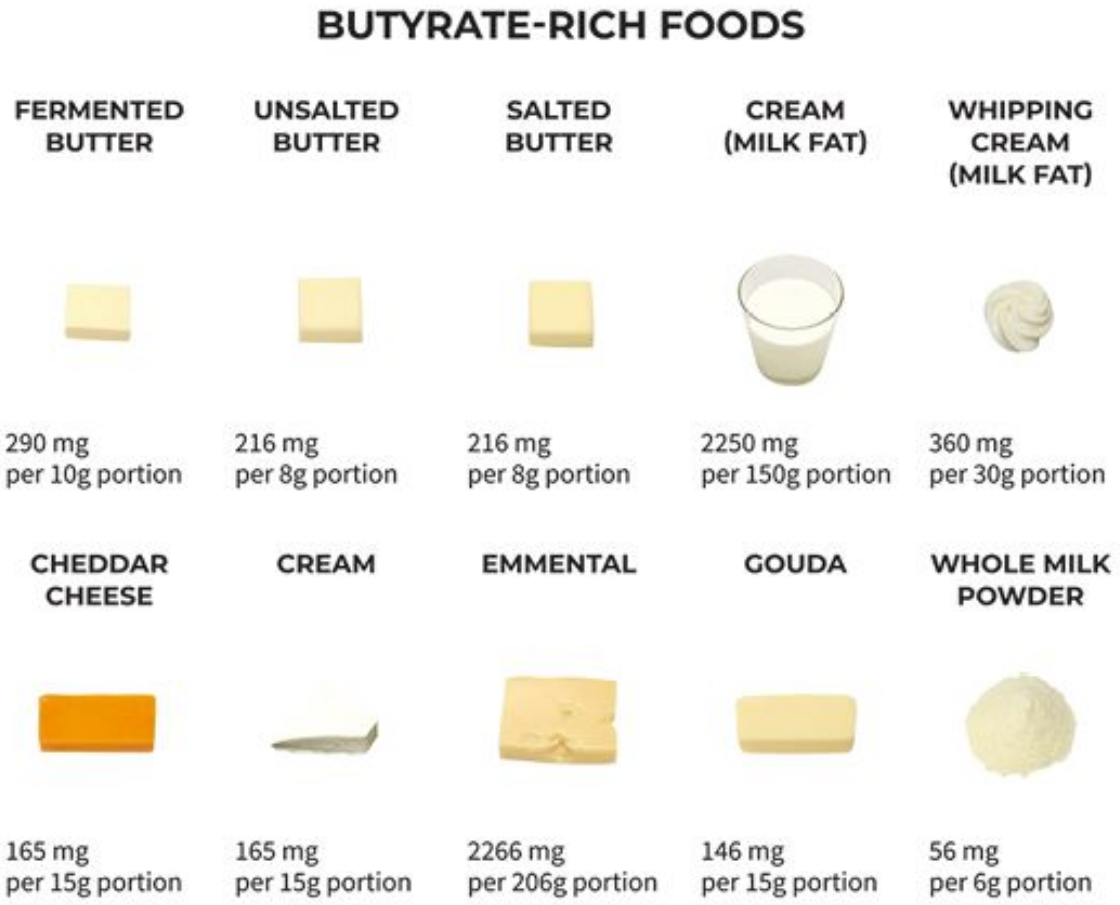


Figure 11.26. Butyrate-Rich Foods. Serving Size Varies.

A CLOSER LOOK AT SHORT CHAIN FATTY ACIDS

While plant foods that make short chain fatty acids are considered optimal health foods, sometimes we forget to consider glucose spikes, anti-nutrients, GMOs, pesticides, allergens, and other considerations.

Note: the following plant foods usually contain more than 100 g per serving.

FIBERS FOR SCFA	PLANT FOODS	CARBOHYDRATES 100 G SERVING	POINTS TO CONSIDER
Arabinoxylan	• Brown rice • Oatmeal • Quinoa • Wheat bran	• 34 g • 68 g • 64 g • 64 g	• All Arabinoxylan: FODMAP, gluten (wheat), lectins, oxalates, phytic acids, protease inhibitor and saponins
Fructooligo—saccharides (FOS)	• Asparagus • Bananas • Chicory root • Garlic • Onions	• 4 g • 23 g • 4 g • 33 g • 9 g	• Flavonoids, oxalates, FODMAP • Oxalates, FODMAP, tannins • Pollen allergens, salicylates • Allium, protease inhibitor, FODMAP • Allium, flavonoids, phytates, FODMAP
Guar gum	• Legumes	• ~65 g	• Lectins • Oxalates • Phytic acid • Protease inhibitor • Saponins • Tannins
Inulin	• Asparagus • Garlic • Leeks • Onion • Wheat	• 4 g • 33 g • 14 g • 9 g • 70 g	• Flavonoids, oxalates, FODMAP • Allium, protease inhibitor, FODMAP Allium, oxalates, flavonoids, FODMAP • Allium, flavonoids, phytates, FODMAP • Gluten, lectins, oxalates, phytic acid, protease inhibitor, saponins, tannins
Pectin	• Apples • Apricots • Carrots • Oranges	• 14 g • 11 g • 10 g • 12 g	• Flavonoids, polyphenols, salicylates • Flavonoids, oxalates, salicylates • Flavonoids, oxalates, root, salicylates • Flavonoids, salicylates, oxalates
Resistant starch	• Barley rice • Beans • Green bananas • Legumes	• 82 g • ~40 g • 20 g • ~65 g • 17 g	• All resistant starch (except banana): FODMAP, gluten (barley), lectins, oxalates, phytic acids, protease inhibitors, and saponins • Green banana: oxalates, FODMAP, tannin

Table 11.27. A Closer Look at Short Chain Fatty Acids.

Some carnivores don't consume any dairy. It may be possible that the minimal amounts of butyrate obtained from animal fats is sufficient. Bacteria also makes butyrate from the leftovers of cells

and mucus. In fact, the end of the colon (the sigmoid colon) relies more on this type of butyrate than the butyrate from foods.[280]

Roles and Benefits of Butyrate

Butyrate helps break down undigested carbohydrates. But what if you don't consume any carbohydrates? While butyrate is essential, how much is needed on a zero carbohydrate, animal-based diet?

The following are the most common benefits of short-chain fatty acids:

Reason 1: May prevent and fight cancer. Most cancer cells are fed by glucose and fructose (yes, fruit) cells.[281]

Counter: What if you aren't feeding the body foods with glucose and fructose?

Reason 2: May prevent heart disease and atherosclerosis.

Counter: High carbohydrate and processed food diet with chronic inflammation contributes to metabolic diseases. If you don't consume foods that cause inflammation or heart disease, does this benefit matter?

Reason 3: Controls blood sugar, hunger, and lowers cholesterol.

Counter: I've discussed glucose and insulin. A carnivore diet supports the proper functioning of hunger hormones. Controlling physical hunger cues—different from mental hunger cues—on a carnivore diet is a nearly nonexistent problem. The irony of blood sugar is that plant-based foods that support butyrate production are the same foods that can cause spikes in blood sugar. Do we need extra butyrate simply to eat these foods?

Reason 4: Supports immune function.

Counter: I've talked about how most of the immune cells are in the gut and how consuming sugar impairs these immune cells.

When sugar and carbohydrates are removed from the diet, the immune system is stronger.

Reason 5: Supports motility and lowers colon inflammation.

Counter: What if you aren't eating foods that cause inflammation? Some of the antinutrients in plant-based foods contribute to inflammation, such as gluten, lectins, and phytic acid. In 2012, a study in the *Journal of Gastroenterology* showed that reducing fiber (pre-cursor to short-chain fatty acids) helped participants with chronic constipation. The study lasted six months, and after two weeks of having zero fiber, these participants were allowed to increase fiber, as needed. These participants felt such relief after two weeks of zero fiber that they continued zero fiber for the full six-month period. Of the high-fiber, small-fiber, and zero-fiber groups, the zero-fiber participants had the most frequency of bowel movements.[282]

Reason 6: Butyrate produces ketones in the liver. Gut bugs produce butyrate for the mitochondria.

No counter here. With the absence or severe reduction of carbohydrates, you will always produce some level of ketones. You can produce ketones without butyrate from plant foods.

While it's too early to say that the body definitively does or doesn't need fiber, if you want some fiber in your diet, take a look at Table 11.26 and have some ham—it's been found to have a bit of fiber.

Salt

Salt can support the hypothalamic-pituitary-adrenal axis (HPA) imbalances, thyroid disorders, and headaches. Salt is beneficial to our brain, as sodium helps move vitamin C into the brain. Salt can promote insulin sensitivity, improve metabolism, reduce stress hormones, and support overall hormone balance. It is also a natural

antihistamine and critical for good digestion. The chloride from the salt makes strong hydrochloric acid, and the calcium from some natural salts will support the acid release in the stomach.

Sodium is one of the most important electrolytes in the body and supports the body's fluid balance. This becomes especially important when removing most carbohydrates from the diet. Glycogen is stored in water in the muscles. When the body is depleted of glycogen stores, the body removes a lot of the water. With less water, electrolytes become critical. Make sure to replenish your electrolytes on days you are more active. Otherwise, you will begin to feel the symptoms of electrolyte deficiencies.

DID YOU KNOW?

If you suffer from migraines, the best option may be to ride out the migraine because they serve a purpose in healing.

Consider healing the gut as toxins from the gut can congest the liver. Toxins run through blood vessels and when these vessels becomes irritated from toxins, the body's protective response is to collapse the blood vessel. This collapsing of the blood vessel causes migraines and pounding headaches. When the blood vessel collapses, the body prioritizes healing the inflamed area. Once repaired, the blood vessel will regain its structure and the migraine will be stop.

By taking medications, the body's process of healing the inflamed blood vessel is interrupted. The next time you get a migraine, the body will have to heal two inflamed, collapsed parts of a blood vessel--often the sign is more intense migraines.

Heal the gut and trust the body's innate wisdom. Stop temporary Band-aids and work on root cause healing.

Consuming too much salt does not raise blood pressure and then increase the risk of heart disease and stroke. Studies show no evidence that limiting salt intake will lower the risk of heart disease. The one caveat is individuals diagnosed with salt-sensitive hypertension that might benefit from monitoring salt intake.[283]

A 2011 study found that lower salt diets may actually increase the risk of death from heart attacks and strokes. Most of all, it did not

prevent high blood pressure. “The investigators found that the less salt people ate, the more likely they were to die of heart disease — 50 people in the lowest third of salt consumption (2.5 grams of sodium per day) died during the study as compared with 24 in the medium group (3.9 grams of sodium per day) and 10 in the highest salt consumption group (6.0 grams of sodium per day). And while those eating the most salt had, on average, a slight increase in systolic blood pressure…they were no more likely to develop hypertension...”[284] Several studies have shown that low salt can increase insulin resistance, elevate LDL and triglycerides, and increase heart failure and even type 2 diabetes (reference Table 11.28).[285]

CAUSES OF HYPERTENSION

Hypertension or high blood pressure can be caused from:

- High sugar consumption
- High refined carb consumption
- High omega-6 seed oil consumption
- Low levels of omega-3s
- Insufficient amounts of magnesium and potassium

In fact, in 2011, a meta-analysis of seven studies that had a total of 6,250 participants in the American Journal of Hypertension found no strong evidence that lowering salt intake reduces the risk of heart attacks, strokes, or death in individuals with normal to high blood pressure.

In another study, the less sodium participants excreted in their urine, the greater the risk of dying from heart disease.

A diet low in salt can cause:

- Insulin resistance
- Increased blood pressure and heart rate
- Increased total cholesterol, LDL and triglyceride levels
- Symptoms such as dizziness, fatigue, sleep disturbances, fainting, and cognitive impairment

Table 11.28. Taylor, Rod et al., "Reduced Dietary Salt for the Prevention of Cardiovascular Disease," *American Journal of Hypertension*, vol 24:8, (2011), 843-853.

Traditionally, salt was used as a tool to preserve food. High amounts of salt prevented bad bacteria from growing. This is how many of the fermented food processes came into play. Today, salt is added to

foods to help manufacturers to find the bliss point. Bliss point is a lab-made formulation of the exact amount of salt, sugar, and fat that optimizes tastiness and, subsequently, the desire to go back for more. Thank Howard Moskowitz, a psychophysicist and market researcher, for turning human food consumption into a massive science experiment. He has earned accolades for helping companies get inside the minds of people.

Processed foods do not use natural salts with minerals. Instead, they use iodized salt that is processed with synthetic chemicals and is toxic to the body. These chemicals include manufactured forms of iodide, sugar, and dextrose to stabilize iodide, fluoride, sodium solo-co-aluminate, sodium bicarbonate, MSG, anti-caking agents, and toxic amounts of potassium iodide and aluminum derivatives.[286] The natural forms of essential iodine are lost when salt is manufactured. Without natural iodine, the thyroid can suffer from dysfunction. Because of this, the salt industry began to add synthetic iodine to their products. Natural salt is not white. Table salt is colored with bleach. Much of table salt is the flaky residue from oil digging. Crude oil extract is one way we produce table salt.

Table salt can also cause headaches with high sodium in the blood and dilation of blood vessels, as the cells won’t let water in because they are protecting the cell-to-salt ratio.

ELECTROLYTE CONSIDERATIONS

The body is comprised of chemical reactions. Supplementing individual nutrients isn't ideal. Here are a few electrolyte complexities:

- If you are deficient in potassium, you may want to increase salt.
- Sometimes too much magnesium and not enough sodium and potassium can cause hypo-adrenals, insomnia, low blood pressure, dizziness and anxiety.
- Adrenals love sodium. So when you're stressed and producing more cortisol, it may be a good idea to add more salt.
- Hypoadrenia (underactive magnesium) might need more sodium and varies with cortisol levels. If you have high cortisol output at night, instead of just focusing on the magnesium before bed, it may be better to salt throughout the day in order to support the adrenals. If you crave salty foods, you may need to support your adrenals.
- Hyperadrenia (overactive adrenals) might need more magnesium. Hyperadrenia usually has high cortisol and high sodium outputs.
- Potassium is closely related to cortisol while magnesium may lower cortisol levels. Low potassium can mean low cortisol output.
- Much of the population is not consuming enough potassium in their diet but too much potassium can cause copper dumping.
- There are also sodium + potassium protein pumps. For every three sodium ions that leave the cell, you have two potassium ions that enter the cell. This level of work requires energy. When you have too much sodium in the cells, the body uses potassium to balance out the cell. Aldosterone and the sodium + potassium pump are just two of many ways that electrolytes go in and out of cells.
- Topical magnesium sprays don't impact sodium levels as much as oral supplementation. Studies have shown that magnesium levels rise faster with topical sprays than with oral supplementation for a duration of nine months to two years.

Table 11.29. Electrolyte Considerations.

I prefer sea salt over Himalayan salt. Himalayan salt is mined—hence the name being rock salt. It's been compressed for millennia

and can be difficult to absorb. Making Himalayan salt water helps because the overnight soaking of the salt in water allows the salt to become digestible again.

The body immediately absorbs sea salt and uses its minerals. Sea salt has the greatest quantity of trace minerals, and the body needs these electrolytes to maintain the right balance of fluids.

Electrolytes

Electrolytes are essential in maintaining balance in the body. Electrolytes help regulate heart and brain function, fluid balance, oxygen delivery, acid-base balance, and other processes.

SIGNS OF ELECTROLYTE DEFICIENCY

ELECTROLYTE	SYMPTOMS	SIDE EFFECTS OF DEFICIENCY AND EXCESS
Sodium	• Muscle cramps • Loss of appetite • Dizziness • Fatigue • Weakness • Headaches • Lack of concentration	*Deficiency leads to Hyponatremia* • Kidney disease • Too much salt or too much water can cause imbalance of electrolytes in the body. • Severe deficiency: Brain damage, thyroid, cancer, and pneumonia *Excess leads to Hypernatremia* • Loss of water can cause dehydration and raise sodium levels. • Severe excess: Fever, vomiting, diarrhea, weakness, and swelling
Magnesium	• Muscle cramps • Twitching at night or after exercise • Nausea • Confusion • Insomnia • Constipation	*Deficiency leads to Hypomagnesemia* • Possibly caused by overconsumption of alcohol, malnutrition excessive loss of fluids. • Severe deficiency: Inability of intestines to absorb *Excess leads to Hypermagnesemia* • Closely related to hypocalcemia and hyperkalemia. • Severe excess: adrenal insufficiency, and diabetic ketoacidosis
Potassium	• Muscle cramps • Muscle paralysis • Mental confusion • Heart palpitations • Increased awareness of heartbeat	*Deficiency leads to Hypokalemia* • Causes abnormal transfer of electrical impulses. • Severe deficiency: excessive urination, kidney failure, cardiac problems *Excess leads to Hyperkalemia* • Possibly due to diuretics and excessive diarrhea • Severe excess: Vomiting, sweating, diarrhea
Calcium	• Osteoporosis • Osteopenia • Muscle spasms • Weakness	*Deficiency leads to Hypocalcemia* • Possible malfunction of the parathyroid hormone. • Severe deficiency: muscle cramps, cardiac issues *Excess leads to Hypercalcemia* • Possibly due to breast cancer, kidney failure, high levels of Vitamin A or D. • Severe excess: depression, kidney stones, and abdominal pain

Figure 11.30. Signs of Electrolyte Deficiency.

We have hormones that control the balance of sodium and potassium in the body. Remember, calcium is dependent on many other cofactors, and the body may throw out magnesium and potassium before throwing out the life-giving salt stores.[287]

In terms of electrolytes, many low carbohydrate dieters take a concoction of electrolytes every day. We should go back to trusting the body to find its natural balance. Every time we consume exogenous electrolytes, we continue to throw off the body's internal balances. Sure, there's a period we may need electrolytes, but over time, we should allow the body to recalibrate on its own.

Iron and Ferritin

Some carnivores find their blood results come back with high ferritin levels (a marker of overall iron status in the body). Hepcidin, a protein that regulates iron metabolism, controls whether iron can go in and out of cells.

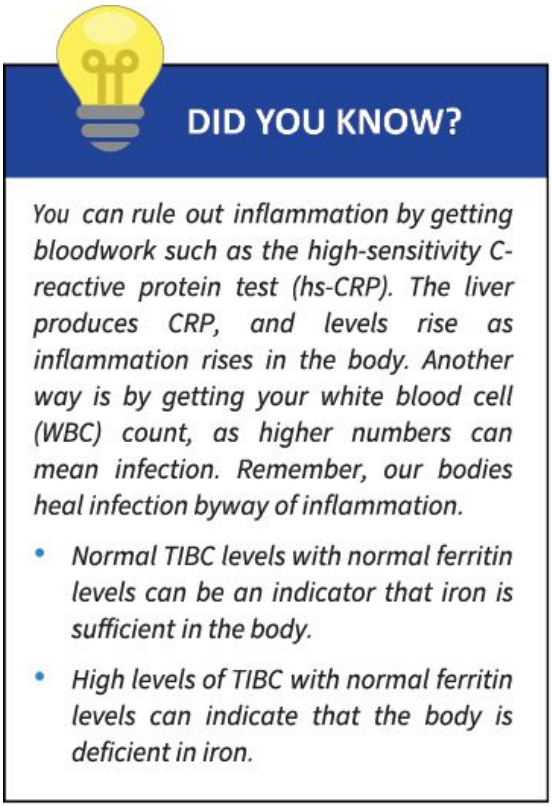
Hepcidin determines iron absorption from the digestive system, utilization of iron from ferritin (stored iron) and iron recycled from damaged cells. Remember, the body has its own wisdom, and if left alone and fed nutrient-dense foods, the body will self-regulate.

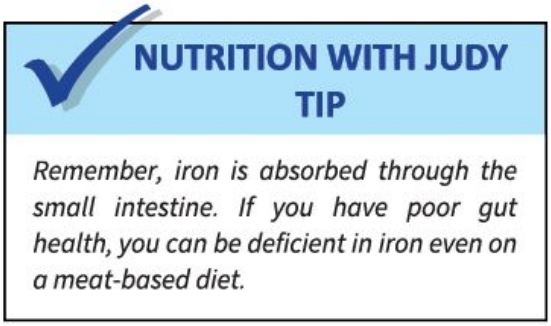
When hepcidin levels are high in the body, the body will absorb less iron from the diet, circulate less recycled iron and convert more iron into ferritin (for storage).[288]

Inflammation is another reason for an increase in hepcidin production. Hepcidin increases as a way for the body to defend against pathogens. As bacteria and viruses need iron for survival, the increase in hepcidin removes a lot of available iron, protecting against pathogens. The increase in hepcidin converts most iron into ferritin. When there is inflammation in the body, ferritin no longer acts

as a measure of iron status but as an indicator of an immune response.

When consuming a meat-based diet, ferritin markers can be high, as meat is naturally high in the bioavailable form of iron. If you ruled out inflammation and an immune response, you could relieve some of the ferritin by donating blood.





If you are concerned about iron levels, you can also test your total iron-binding capacity (TIBC). TIBC measures the maximum amount of iron your blood can carry. Iron enters the body through the small intestine and then stored (ferritin) or moved into the blood (transferrin, a protein produced by the liver).

Transferrin prevents iron-causing-damage by stopping free radical production. TIBC is an indirect measure of transferrin. By getting bloodwork, you'll know how much iron is being stored (ferritin) and

how much is circulating (transferrin via TIBC). Optimal TIBC levels are essential to know if the body is maintaining iron levels.

Typically on a carnivore diet, the high ferritin levels are from a high protein diet and not due to inflammation. Bloodwork can provide you better insight into the reasons for high levels of ferritin.

Insulin

The more you ride the carbohydrate-insulin roller coaster, the more you risk becoming insulin resistant. Figure 11.31 depicts this rise and fall of blood sugar.

The more that insulin stores food away as fat, the more you will need to keep eating to be satiated. It's a vicious cycle of hunger, eating, tiredness, and moodiness. The excess energy will continue to store as fat, and eventually, you will be at risk for metabolic disease.

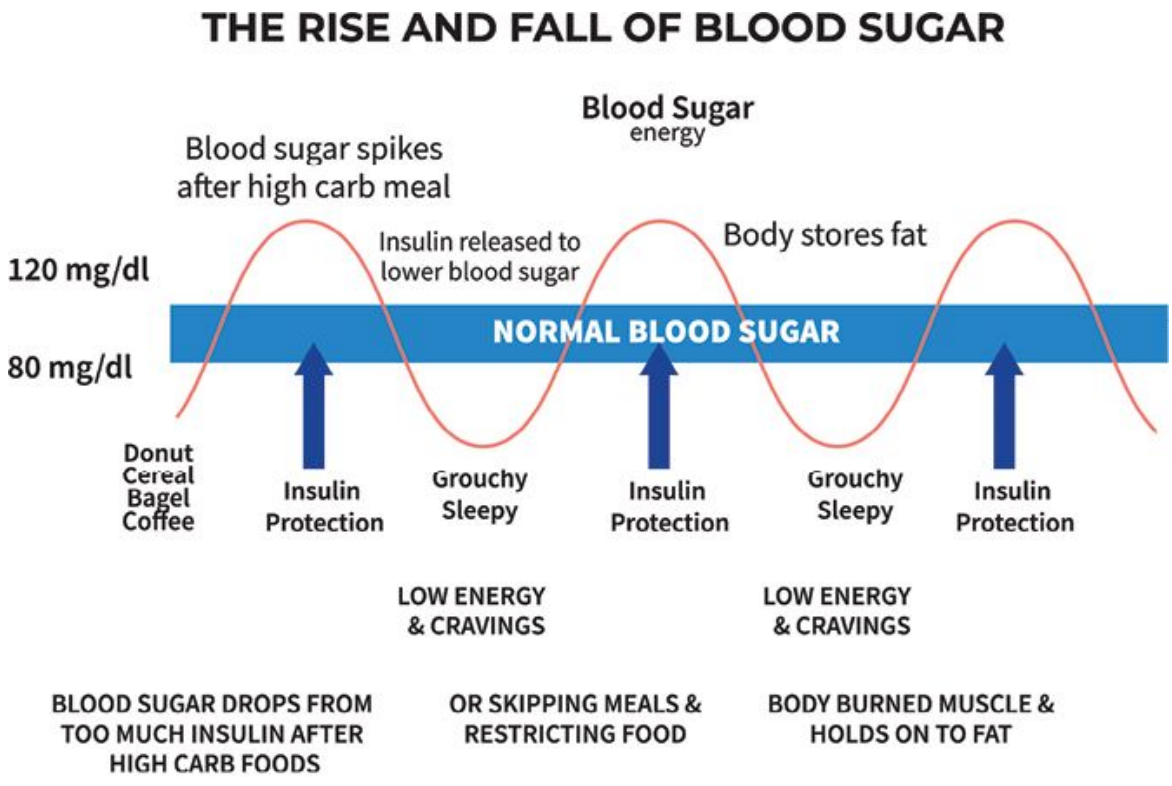


Figure 11.31. The Rise and Fall of Blood Sugar.

Inevitably, the body will need even more insulin to shuttle away glucose, and the pancreas will have to produce more, with less effect, leading to hyperinsulinemia. Studies have also shown that when hyperinsulinemia occurs with a high carbohydrate diet, eventually higher triglycerides ensue. With insulin resistance, weight gain and systemic inflammation are common. The key is to reduce inflammation and reduce insulin. A significant way to do this is to reduce carbohydrates from the diet.[289]

Hyperinsulinemia causes an inflammatory environment in the body. Antioxidants can remove some free radicals in the body but you must fix the root cause. The root cause of high insulin from high glucose foods will always perpetuate inflammation. This is why people with diabetes die from heart attacks and stroke more than any other comorbidity.

The pancreas is where insulin and glucagon hormones are made. Remember, in the digestion section, one of the digestive roles of the pancreas is to release pancreatic enzymes in the small intestine to further break down foods. When the pancreas can't do this, leaky gut is inevitable. Normalizing insulin levels can support our gut to produce more pancreatic enzymes and heal some of our digestive woes.

Advanced Glycation End Products

Advanced glycation end (AGE) products are harmful compounds that occur when foods are cooked (in any form) at high temperatures, especially above 446°F. AGEs also can occur in the body, especially when blood sugars are elevated.

We also consume AGEs with cooked and processed foods. AGEs are typically removed with enzymes and through the kidneys but

usually accumulate over time in the body, especially with a decline in kidney function.

AGEs may cause cell damage, chronic inflammation, oxidative stress, and premature aging. With that said, high levels of AGEs have been found in healthy older people and people with chronic diseases. It is unclear what exact role AGEs currently play in overall health and longevity.[290]

For example, do high blood levels of AGEs cause and speed the progression of diabetes? Or is it diabetes that causes higher AGE levels? Will reducing AGEs lower chronic disease? Which AGEs are truly harmful? This is all unknown.

Grilled, fried, seared, baked, and roasted foods have higher AGE levels than those steamed, boiled, or poached. Processed foods tend to have more AGEs than home-cooked versions. Aged cheeses (without any cooking), margarine, butter, mayonnaise, oils, nuts, and highly processed foods all have high levels of AGEs. Meat is not the only food with AGEs.[291]

One way to test inflammation in the body is by getting blood work such as a high-sensitivity C-reactive protein test (hs-CRP). The liver produces CRP, and levels rise as inflammation rises in the body. When you eat processed foods, the body will also increase inflammation and release C-reactive proteins. The test is typically used to evaluate the risk of developing coronary artery disease.

If you are concerned, braising meats can help reduce AGEs. Lemon juice, vinegar in marinades and broth liquids help to decrease AGEs.

Heterocyclic Amines and Polycyclic Aromatic Hydrocarbons

If you overcook your meat, heterocyclic amines (HCAs) and polycyclic aromatic hydrocarbons (PAHs) are produced. HCAs are formed when amino acids and sugars react in high heat. HCAs are primarily in cooked meats from pan-frying and grilling over an open flame. When baked potato and sweet potato skins get crunchy and crispy, the heating process causes the skins to have HCAs. Smoked meats usually are exposed to PAHs. PAHs are also found in cigarette smoke and fumes from car exhausts. PAHs have also been found in soils and in marine waters.[292]

Temperature is the most critical factor in the formation of PAH and HCAs. They start to form around 212°F (100°C). Continuously turning meat over on a heat source can help reduce HCA formation. Sometimes marinades can act as a barrier between meat and carcinogens. The American Institute for Cancer Research recommends 30 minutes of marinating meat to reduce HCAs.[293]

No human population studies have been established to prove a link between HCA and PAH-exposed meats and cancer.[294] But if you are concerned about PAHs and HCAs, you can always prepare your meats using a non-pan fried or non-grilled method.

IGF-1 and mTOR

Insulin-Growth like Factor (IGF-1) is a growth hormone that helps cell growth in the body (good and bad) and typically signals the mammalian target of rapamycin (mTOR) pathway. Studies have shown correlations between lowering IGF-1 and mTOR pathway stimulation and a reduction in age-related diseases. IGF-1 can be stimulated by the consumption of animal proteins and insulin and blood sugar issues. Low protein intake has been shown to have lower IGF-1, lower cancer, and overall mortality but not for the older population.[295]

mTOR is a signaling pathway. Whenever an abundance of calories is consumed—especially proteins—the cells increase ATP production and then work to divide, grow, and repair. mTOR can increase performance, but with energy production, waste products can also be created in the body. Too much mTOR has been associated with metabolic and degenerative diseases.[296]

High levels of mTOR have been shown to shorten lifespan. This is where fasting can help, as, in times of reduced-calorie or nutrient intake, mTOR is inhibited. The ideal may be to cycle on and off mTOR where the body can perform and build muscle as needed, but also increase longevity and decrease cancer risks with rest.

When consuming a meat-based diet, there are longer windows of fasting, causing a natural rise and fall of IGF-1 and mTOR. The research is still in its infancy to take a firm stance. In the meantime, eating a meat-based diet, which usually puts the body in a cyclical ketogenic state, fasting intermittently, walking at an intense rate and incorporating low-intensity aerobic exercise have all been proven to lower IGF-1 levels.[297]

Low Energy and Homocysteine

Sometimes we need to fine-tune a carnivore diet to have better energy. Here are some reasons why this may happen:

B-Vitamin Deficiency

Sometimes being on an all-meat diet can still cause vitamin B deficiencies. Remember, most of us are deficient in stomach acid, which ultimately affects the ability to break down foods and absorb nutrients. One mineral we need to make hydrochloric acid is zinc. With insufficient amounts of zinc, we debilitate our ability to make hydrochloric acid. It’s a perpetual cycle that may need additional

support to resolve. Support comes in the form of betaine hydrochloric acid and digestive enzymes for protein breakdown such as protease and pepsin and fat digestive enzymes such as lipase.

If you often feel tired after meals, one reason may be the overconsumption of protein and the body's inability to break down proteins efficiently. One indicator of this is high glucose numbers a couple of hours after eating. As you rely on fatty acids for energy, the demand for the amino acid L-Carnitine increases, and if there are insufficient amounts of L-Carnitine in the body, the result is general fatigue.[298]

Another option is to have two to three meals a day. When you consume less in one meal, your body may better digest foods and manage glucose numbers after eating.

Mitochondria

Most of the mitochondria are in the brain and muscles. When the body has mitochondrial dysfunction (metabolites seen in functional tests), it can result from nutritional deficiencies, coenzyme deficiencies, toxic disease infection, and even the inability to break down and use amino acids, such as leucine. An indication of possible dysfunction is fatigue. Some individuals may benefit from some CoQ10, acetyl-L-carnitine (acetyl is in the form the brain can utilize), and B-complex, focusing on B6.

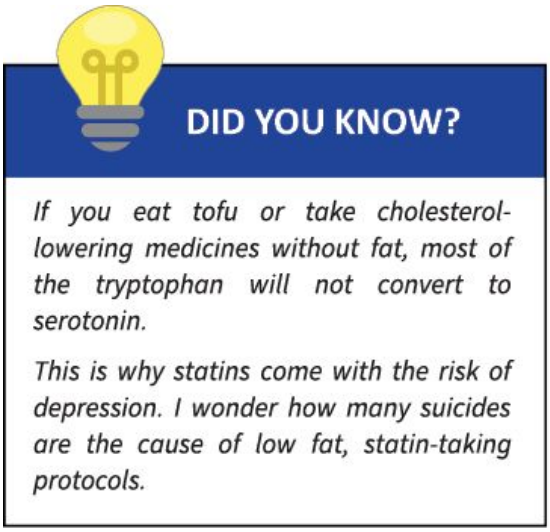
Neurotransmitters

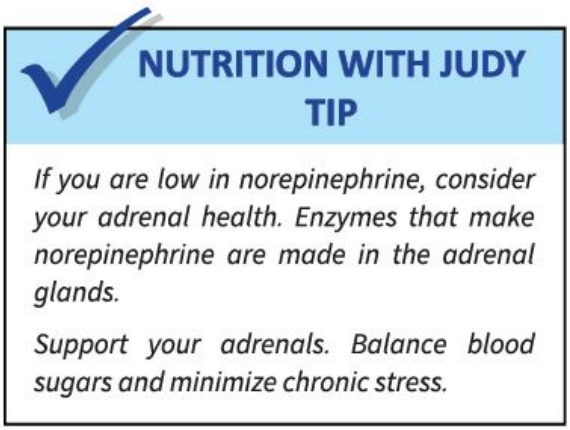
Neurotransmitters are impacted by the improper breakdown of proteins. Sometimes the inability to break down leucine can impair mitochondrial function. An overgrowth of yeast can also adversely impact neurotransmitters. An indication of neurotransmitter dysfunction is low mood. Some individuals may benefit from CoQ10,

acetyl-L-carnitine, riboflavin, nicotinamide (vitamin B3), and vitamin E. In some cases, copper and vitamin C can help.

Make sure to work with a practitioner to ensure you are supporting the body. Figuring it out on your own can sometimes do more harm. Let's take GABA as an example. Many people take GABA for mood support and for anxiety and sleep. But GABA is a neurotransmitter, and it gets tricky to play with the biochemistry of the body. There is a reason that you are feeling anxious and sleep poorly. Using a temporary aid like GABA can help, but it can also cause more longer-term health effects.[299]

You may have low levels of serotonin, which can impact sleep. Sometimes serotonin is low because of inadequate levels of B6. Many individuals with autoimmune disorders have a risk of low B6 levels. Maybe it's B6 you need and not GABA.





Eating foods with tryptophan help produce more serotonin. Niacin (vitamin B3) helps to boost tryptophan, and vitamin B6 helps to convert tryptophan to serotonin. Folic acid (vitamin B9) also helps make serotonin. Lastly, vitamin D activates genes in the body, responsible for neurotransmitter release, such as serotonin. Meats and dairy have the highest concentrations of B vitamins and vitamin

D. If you already eat these foods, but have low mood, I recommend looking into gut health.

When you don't have enough B vitamins, the body will prioritize the most important areas for survival. B2 is needed to make energy from fatty acids, but it is also needed to make Phase 1 detox enzymes (P450). If we don't have enough B2, the body cannot properly detoxify toxins in the body.

Vitamin B6 is needed for liver enzyme functions and for epinephrine and serotonin synthesis. On the organic acids test, I often see clients with high yeast and bacterial markers, deficiencies in B6 and low functioning neurotransmitters. These results confirm that the gut is impaired, the liver is stressed, and consequently, it affects mood and energy levels. B6 deficiency also increases circulating oxalates in the body.

Homocysteine

I always recommend my clients get their homocysteine checked. Homocysteine is an amino acid that, when the body has too much, can increase risks of heart disease. A deficiency in B vitamins can affect the homocysteine and methylation process.

Elevated blood levels of homocysteine and methylmalonic acid are signs of B vitamin deficiencies. Vitamin B6, Folate (B9), and vitamin B12 help regulate the amount of circulating homocysteine.

Homocysteine at a level of 6 or 7 µmol/L is ideal, and if it is above 7 µmol/L, methylated B vitamins may be needed. If homocysteine is < 6 µmol/L, then glutathione—the body's master antioxidant—may be needed. Figure 11.32 depicts the homocysteine, glutathione and methylation pathways.

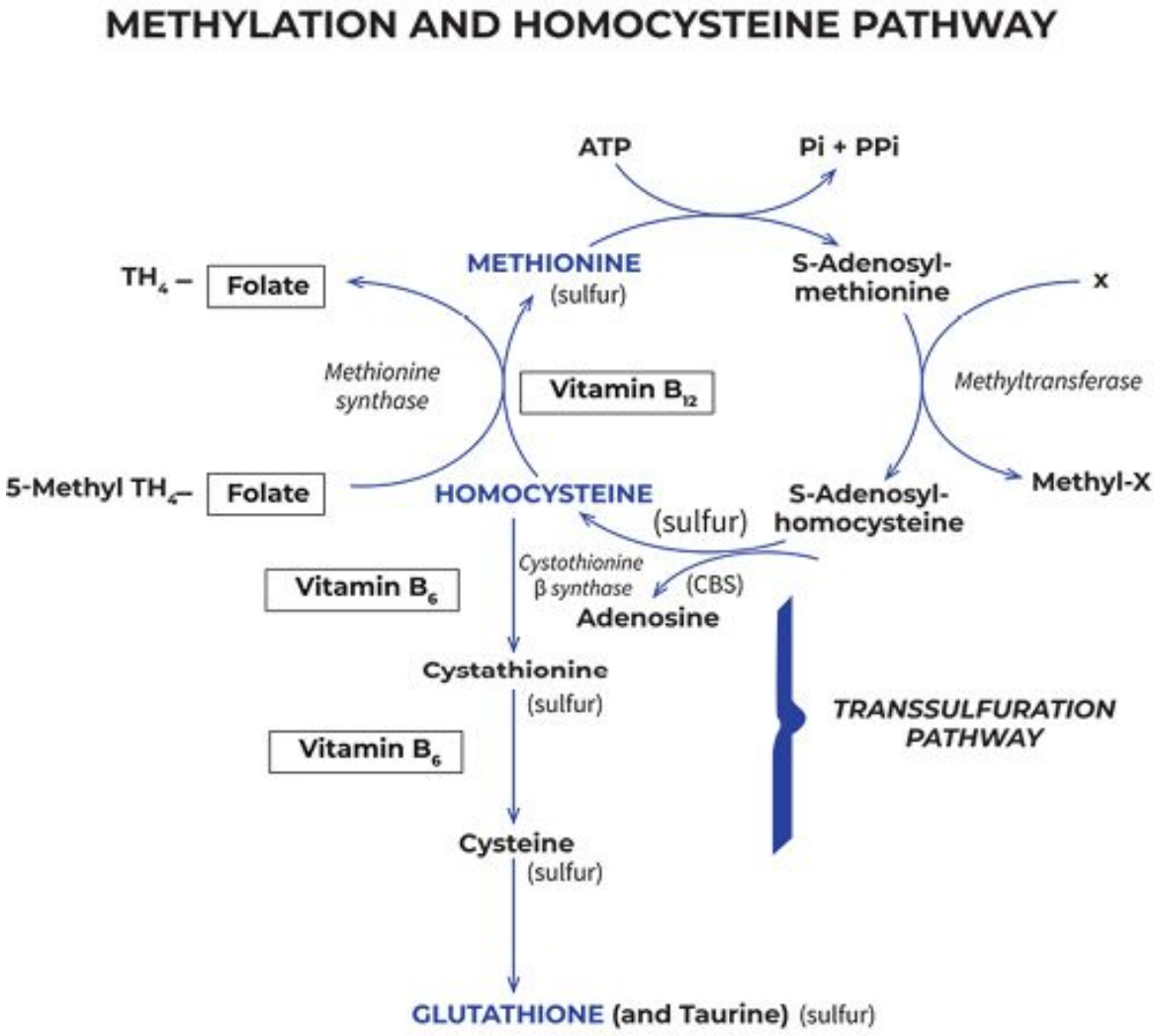


Figure 11.32. Methylation and Homocysteine Pathway.

Insufficient methylation can cause an imbalance of histamines, causing itchiness, hives, and allergies. Insufficient methylation and insufficient glutathione can cause toxins to recirculate in the body and get reabsorbed. This may be why some individuals have a hard time detoxing heavy metal.

These are some areas to help you figure out how an animal-based elimination diet can get you back to optimal health. I hope this section provides the science as to why a carnivore diet does not

have nutritional concerns and also provides some troubleshooting tips to optimize the carnivore diet.

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Chapter 12

Hormones and Zero Carbohydrates

Whenever you find yourself on the side of the majority, it is time to reform (or pause and reflect).

— Mark Twain

THE ENDOCRINE SYSTEM is the hormone production system. The body creates more than 100 hormones, and hormones transfer information and instructions from one set of cells to another (reference Figures 12.1 and 12.2).

Some conventional practitioners believe that consuming minimal carbohydrates can drive insulin levels too low. As a result, as insulin is involved in the thyroid hormone conversion, it can then cause low energy. The thinking is that not enough insulin is converting the inactive thyroid hormone (T4) to its active version (T3), leading to drops in metabolic rates.

Women who struggle with low thyroid function and loss of menstruation cycles are cautioned against following a zero carbohydrate diet. But what is causing low thyroid function and sex hormone dysfunction?

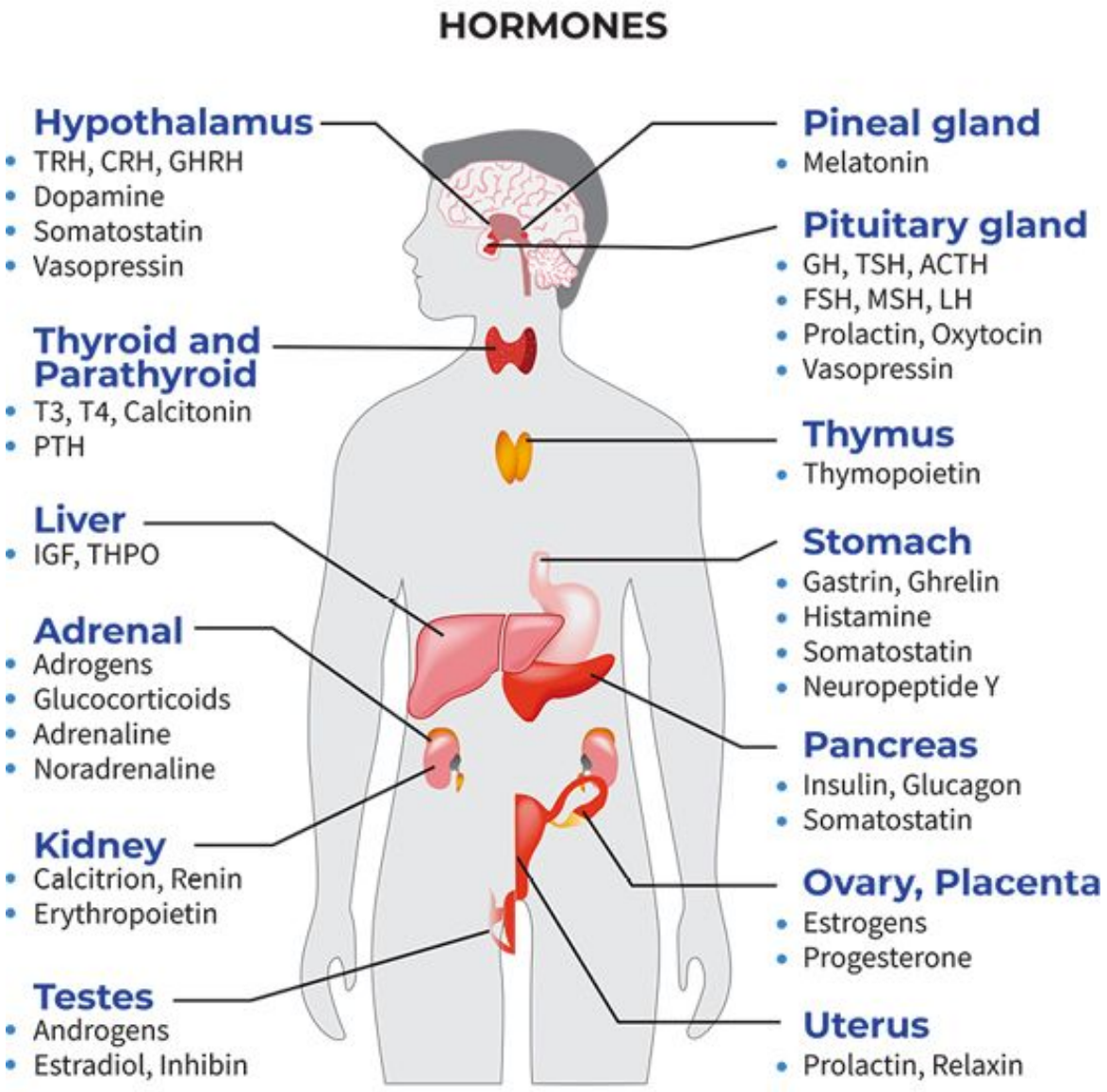


Figure 12.1. Some of the Hormones in the Body.

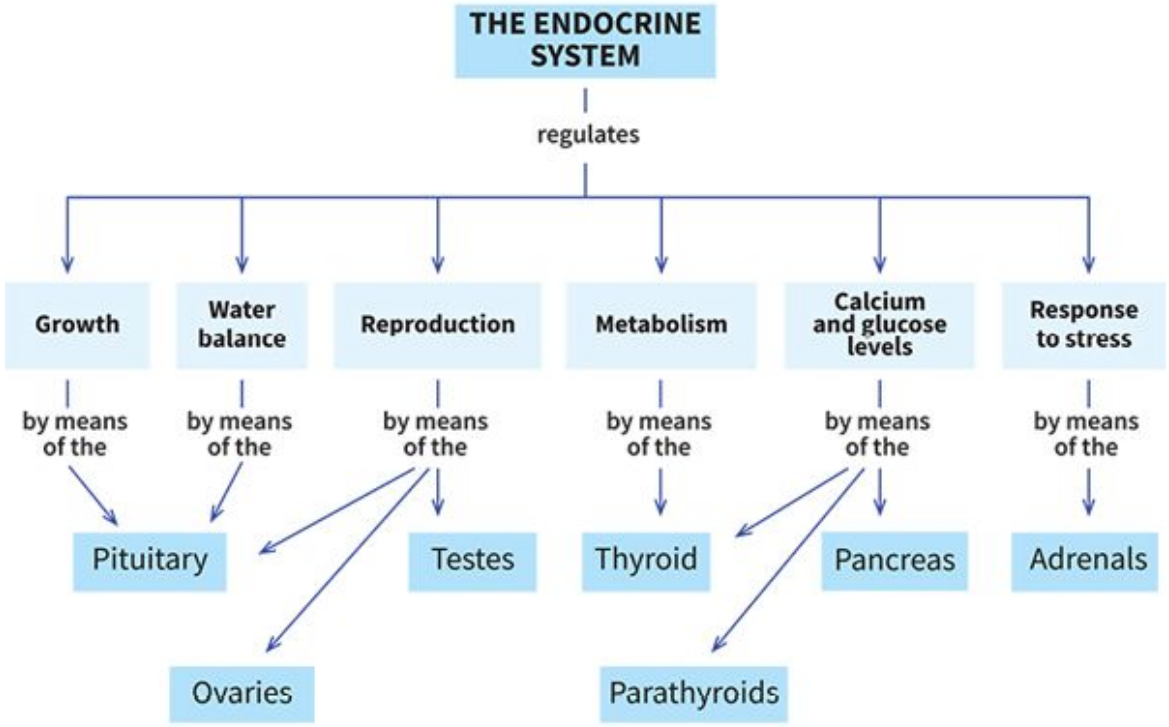
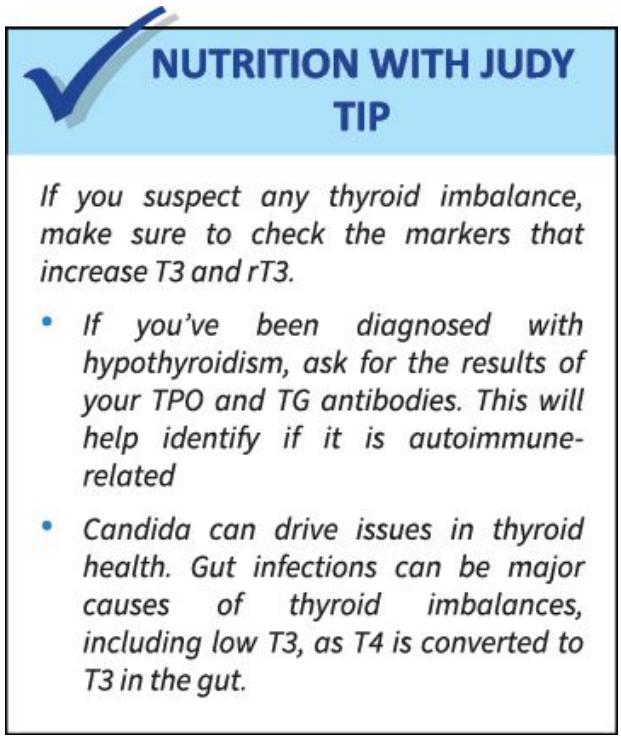


Figure 12.2. Roles of the Endocrine System.

In lab tests, low thyroid (hypothyroidism) looks like low T3 levels, low T4 levels, and high TSH numbers. On a zero carbohydrate diet, people tend to have better energy levels than on a standard American diet. While they tend to see lower T3 numbers on lab results, the TSH remains the same.



Two of the most common reasons for hypothyroidism are autoimmune inflammation and iodine deficiency. As our society is becoming more estrogen-dominant (from foods and environmental toxins), we see more issues with thyroid health. Estrogen dominance is commonly seen with excess fat, post-menopausal women, and women taking birth control pills. Yes, birth control pills can increase the chances of hypothyroidism.[300]

On a carnivore diet, if you have low T3 levels but no significant increase in TSH, and you have no symptoms of low energy, then you can assume the low T3 levels are the new normal. If the T3 is low and the TSH is high, then more investigating is needed.[301] (If you follow a zero carbohydrate diet, it is vital to find a practitioner who can read lab results in the context of a zero carbohydrate, carnivore diet.)

A drop in T3 is not concerning as long as there is no rise in TSH, as the process is a feedback loop: if the body senses that thyroid hormones (T4 or T3) are running low, it releases more TSH to

stimulate the release of thyroid hormones. You can see a depiction of the feedback loop, “normal” ranges for thyroid hormones, and possible reasons for the increase in T3 and rT3 in Figure 12.3.

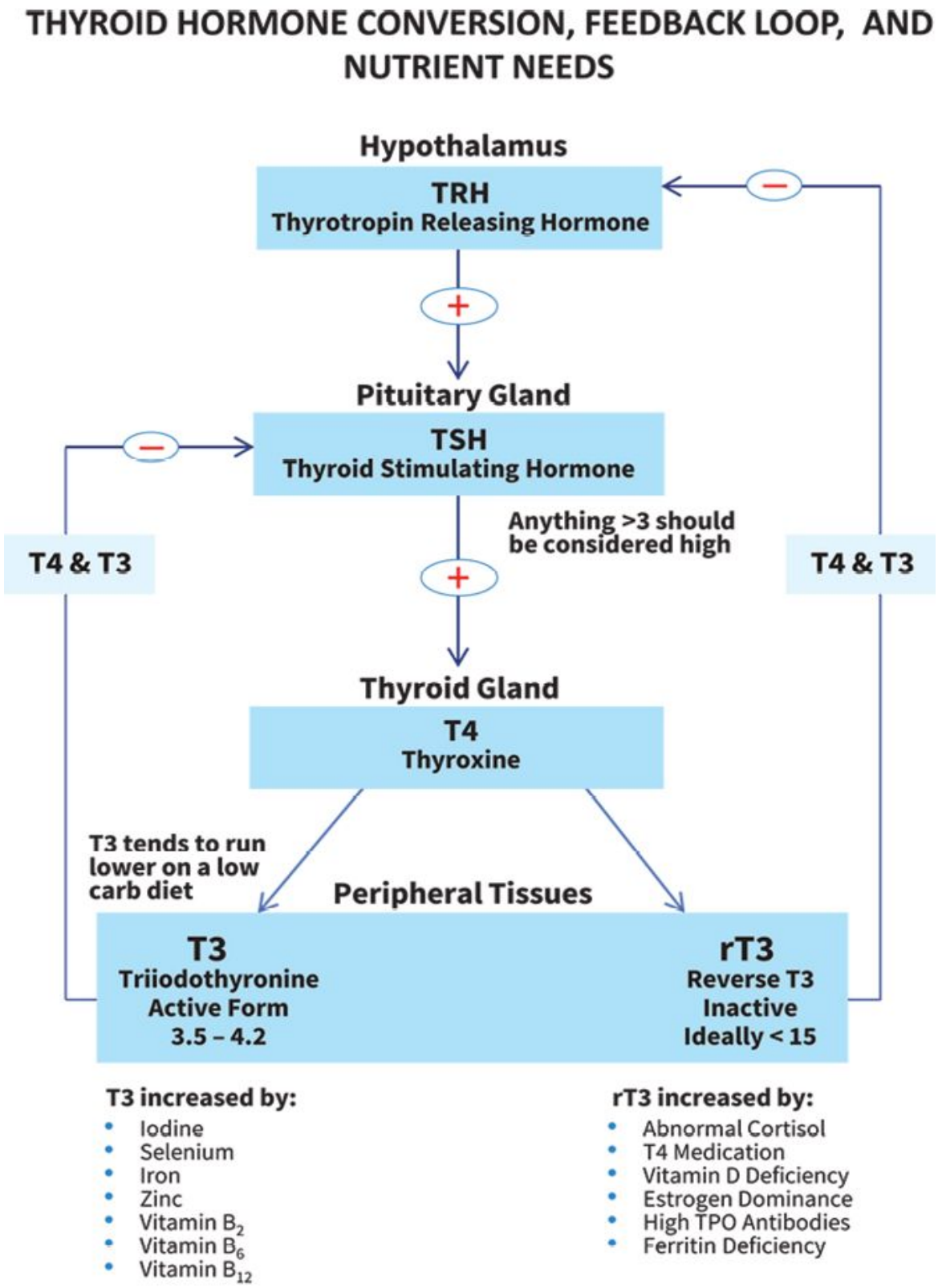
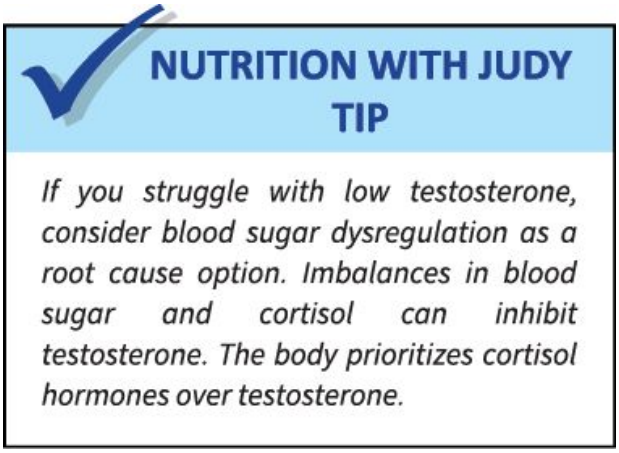


Figure 12.3. Thyroid Hormone Conversion, Feedback Loop and Nutrient Needs.

One explanation for these lab differences is that there are thyroid receptors all over the body (peripheral thyroid receptors). Dr. Jaime Seeman, a low-carbohydrate obstetrics and gynecology practitioner, says that this might be why some individuals can have out-of-range numbers for TSH, T4, and T3 but feel normal—because their peripheral T3 is normal. Standard hormone panels are taken from the blood because it is difficult to test thyroid hormones in the peripheral tissues.[302]

Reverse T3 (rT3) may be at a higher range with mineral deficiencies such as selenium and zinc, or when you are under significant stress. If you have low thyroid function, testing for high levels of Thyroid Peroxidase (TPO) antibodies or anti-thyroid globulin can determine if you have the autoimmune condition Hashimoto's disease. Hashimoto's often results from high inflammation and insulin resistance and can be caused by gluten and dairy sensitivities.



Nutritional Support and Insulin

If you are concerned that zero carbohydrates drive insulin too low (and adversely impact hormonal health), then consider these nutrients that impact insulin:

Vitamin E is a lipid-soluble antioxidant, and supplementing with vitamin E may improve insulin functionality.

Magnesium deficiency can play a role in developing insulin resistance.

Calcium is an essential component of insulin-responsive tissues such as fat tissue and skeletal muscle. Calcium must be tightly monitored for proper insulin-mediated functioning.

Vanadium (vanadate), a trace mineral, possesses insulin-like activities and has shown to increase insulin sensitivity in both invitro stimulated insulin secretion, as well as in animal tissues.

Chromium is a catalyst in the action of insulin.[303]

Copper plays a role in insulin binding.

Potassium is needed to assist with insulin secretion. Insulin puts potassium into cells by way of the sodium-potassium pump in each cell.

Zinc is required for insulin processing. Low zinc levels can adversely impact glucose tolerance. Remember, you also need zinc to produce enough hydrochloric acid. If the gut is damaged from carbohydrate-rich foods, you can't break down meats to access zinc.

Get to the root cause. Maybe you are zinc deficient, rather than carbohydrate-deficient.

If we know that carbohydrates are a nonessential macronutrient, why would the body require carbohydrates for hormone function?

Hormones determine the action and inaction of all cells. It's a significant role in the body to be dependent on a nonessential macronutrient.

Stress, Adrenals, and Hormones

Chronic stress causes the body to be in a chronic state of fight or flight. Eventually, this constant state of emergency causes the adrenals and the entire hypothalamic-pituitary-adrenal (HPA) axis to breakdown (reference Figure 12.4).

Adrenals

The endocrine system is very complex. Remember, the adrenals help to regulate the immune system, our metabolism, and the overall stress response. The adrenals have three essential hormonal functions: producing sex hormones, supporting blood sugar and inflammation (part of the fight-or-flight mechanism: the adrenals release energy so you can run), and regulating minerals, especially sodium and potassium. Remember, hormones are master communication initiators in the body.

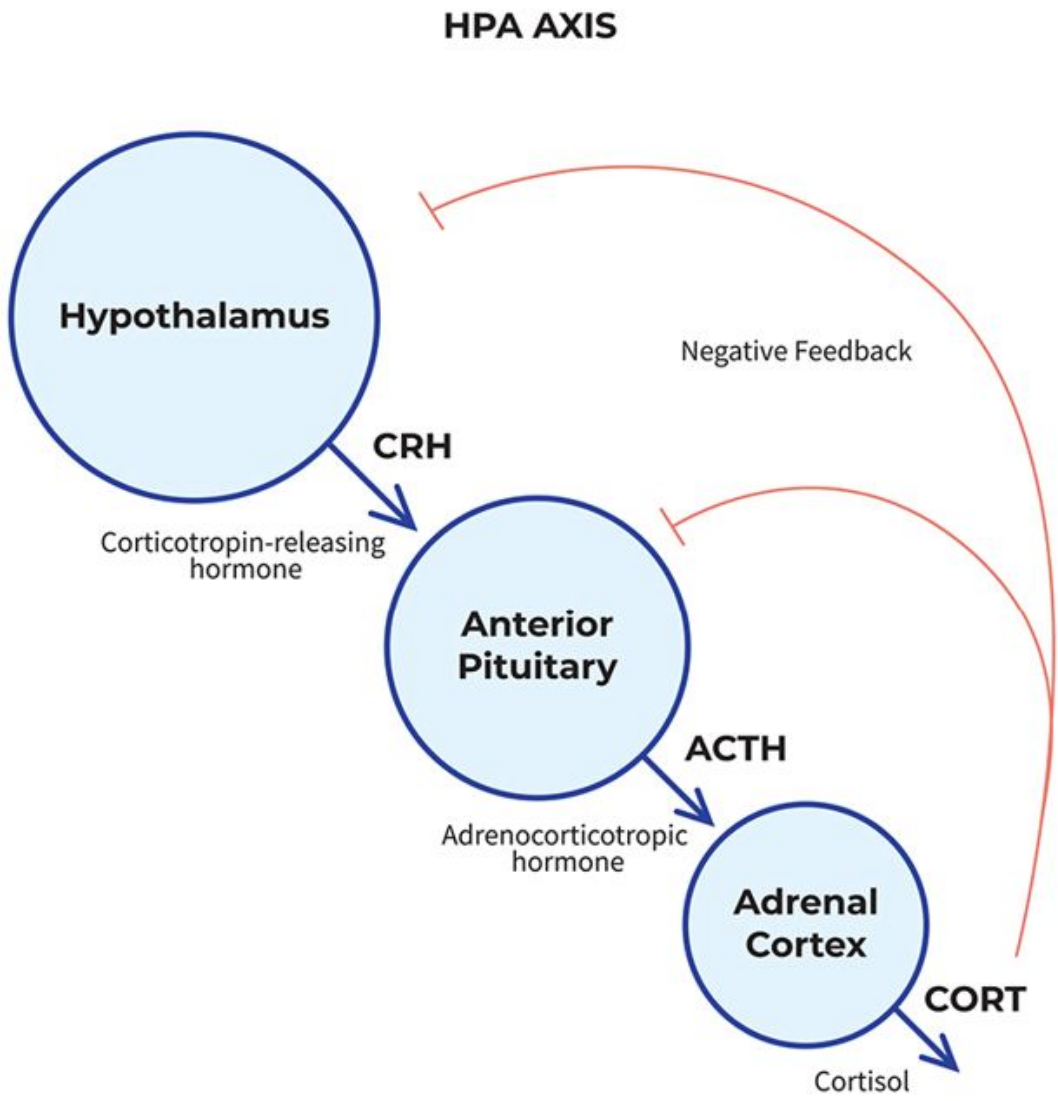


Figure 12.4. HPA Axis.

ACUTE VS. CHRONIC STRESS

The body is designed to handle acute stress but not meant to deal with chronic stress. Acute stressors are sudden but typically short-lived, threatening events. Chronic stressors are typically from ongoing, environmental demands, often physiological and psychological in nature.

ACUTE STRESS	CHRONIC STRESS
• Giving a speech 	• Drive to work 
• Intermittent fasting 	• Poor diet 
• Lifting heavy weights 	• Poor sleep habits 
• Life change (e.g., birth, death) 	• Marital conflict 
• Presentation at work 	• Negative friends 
• Running sprints 	• Work stress 

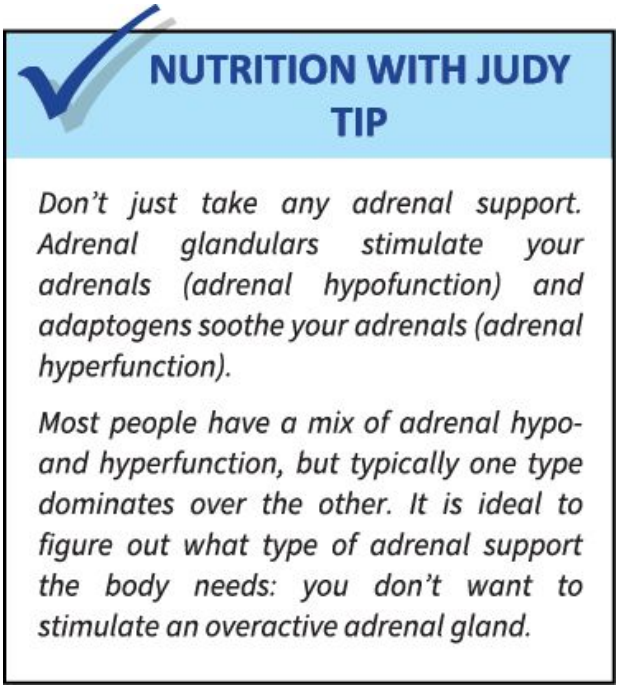
Figure 12.5. Acute vs. Chronic Stress.

When the body is chronically stressed, it forces the adrenals to release cortisol (the stress hormone) continuously. But this comes at a cost. Remember, cortisol is expensive to make, and the body will prioritize the mechanisms in the body that will keep you alive. This means that balancing blood sugars altered by cortisol and stress takes priority over sex hormones, metabolic health, and even immune health. The adrenal glands are essentially permitted to steal nutrients and hormonal precursors from the rest of the endocrine system.

Have you noticed when you're stressed that you get sick more often? It's likely because nutrients like the B vitamins and sodium are prioritized to make cortisol instead of supporting normal function in the body.

Over time, a lifestyle marked by chronic stress and the consumption of refined, processed sugar will lead to a breakdown of the HPA axis. If your legs are only equipped to sprint for short bursts and in very limited quantities and frequencies, imagine continually pushing the body to be sprinting—something will eventually give. That is what is going on with the body's hormones, adrenals, and the overall endocrine system.

Now imagine that, instead of fixing the root cause—that you are sprinting 24/7—you instead get some pain relief medicine that enables you to keep sprinting. You may be able to sprint a little longer, but something will eventually give. With medications and hormone supplements, you maintain this dangerous cycle. This can cause severe and irreparable damage to the body.



The Complex Web of the Endocrine System

If you start showing signs of low estrogen or low progesterone, I advise that you reconsider using creams and taking hormone replacements as the first line of defense. You could be adding pain medication to a constant sprint.

Imbalances in sex hormones are an increasingly serious condition in the United States: 1 in 6 couples deals with infertility (17 percent), and male infertility is the leading medical issue in about 30 percent of all infertility cases. If you start taking testosterone, progesterone, or estrogen, you are essentially using pain medication to maintain your constant sprint.[304]

The endocrine cascade is a downstream effect of several things gone wrong. The imbalance in sex hormones is usually the end result. Figure 12.6 provides a visual of the endocrine cascade, and Figure 12.7 shows some of the complexities of the endocrine system.

When you have low-functioning thyroid, low energy, and a low sex drive, how do you know what the main culprit is? What if the low energy is not an imbalance in the thyroid but an imbalance in the adrenals? I want you to visualize the complexity of the endocrine relationship and how so many pathways and factors are affected by hormones. Now, again, imagine just adding the pain medication to the constant sprint. What harm is being done to the body? What if the temporary pain medication allows you to sprint today but never lets you sprint again in the future?

If blood sugar imbalance is a core reason the endocrine system (which includes the adrenals and the thyroid) starts to start breaking down, I'm not sure the advice—you must moderate carbohydrates to heal hypo- or hyperthyroidism and balance hormones—is sound. And if standard care says it's for the health of the gut microbiome, I'd refer them to the fiber chapter (Chapter 11).

Supplementing one hormone is not going to solve the root cause of the endocrine disruption. What also happens when you take cholesterol-lowering statins? What does it do to the endocrine system and steroid hormones?

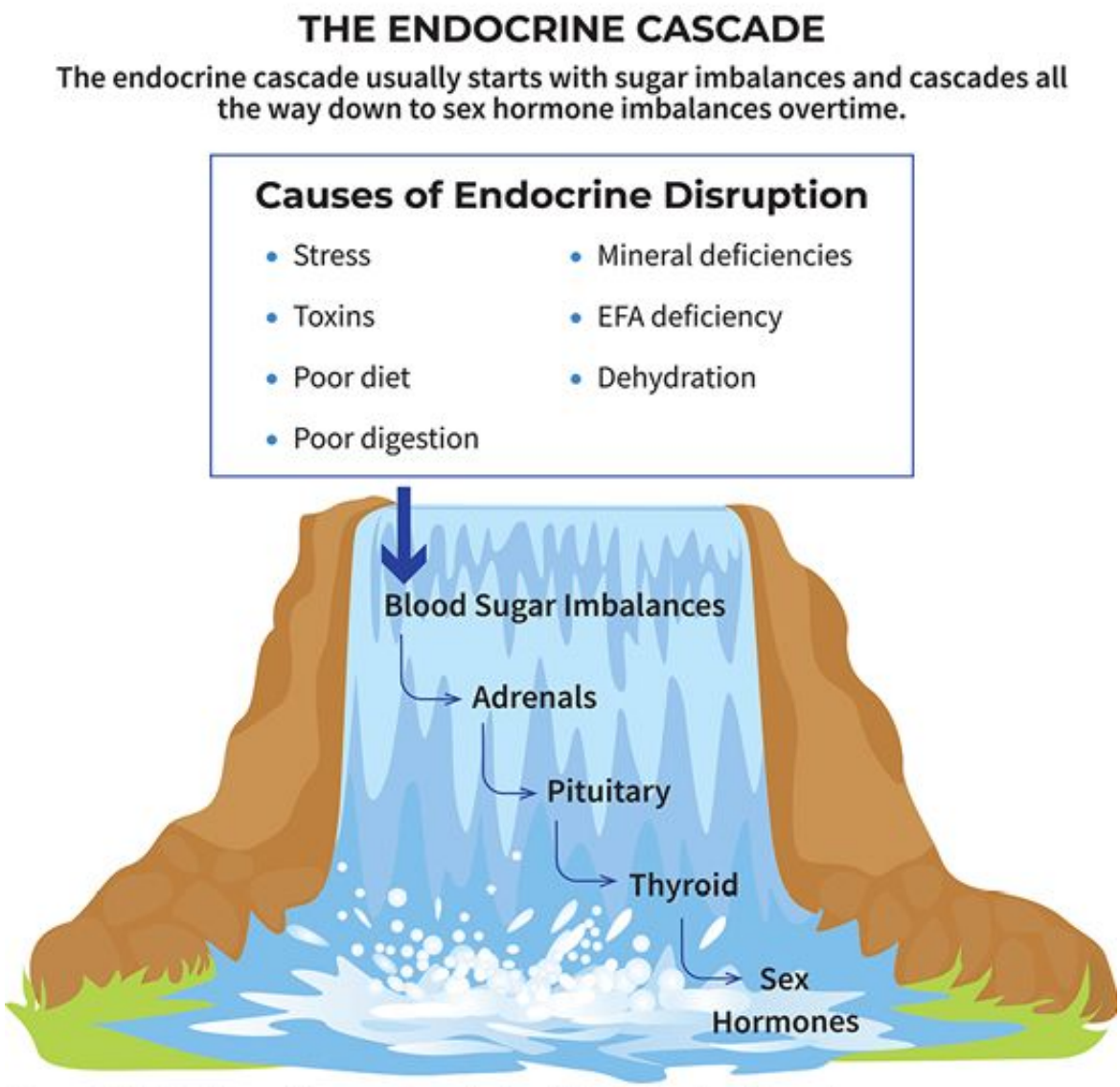


Figure 12.6. Nutritional Therapy Association, The Endocrine Cascade.

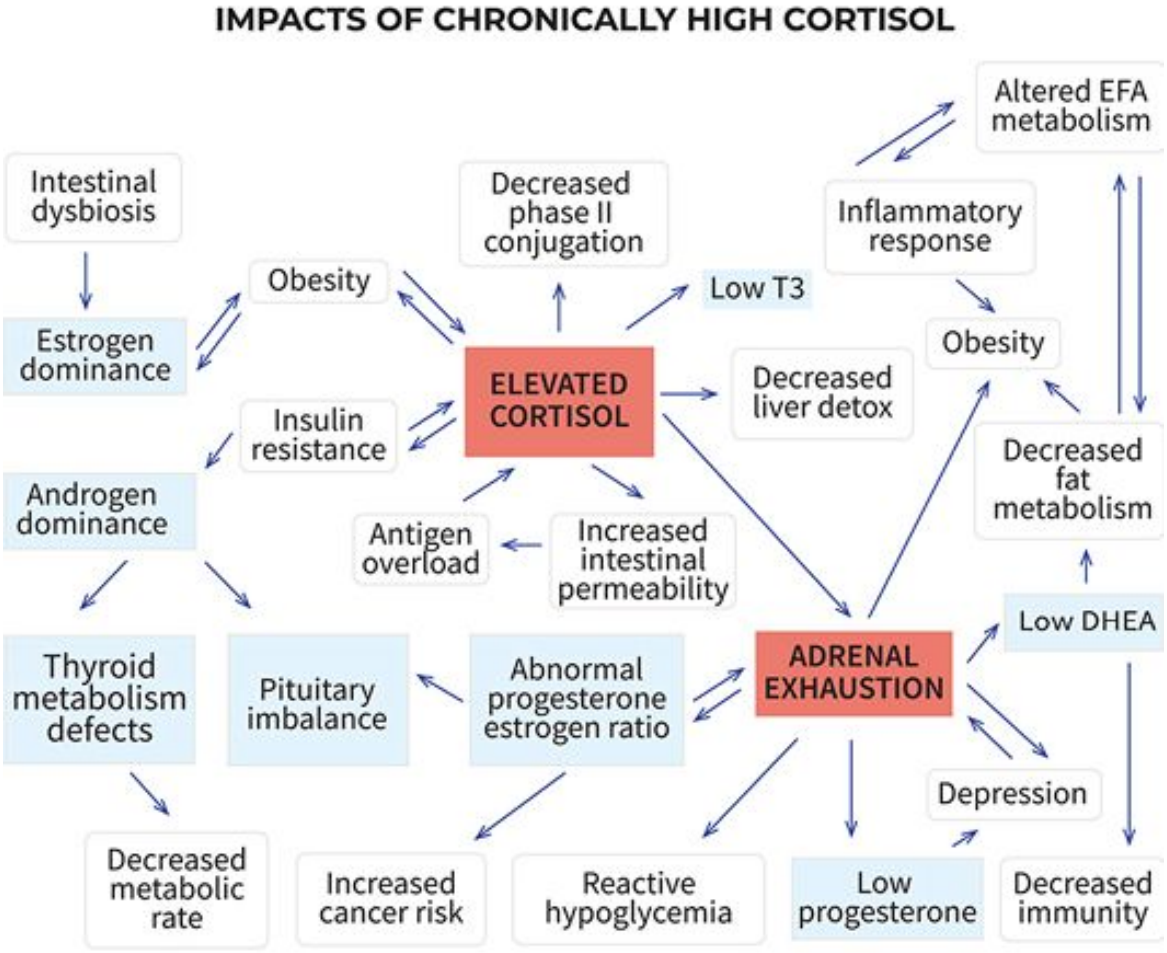


Figure 12.7. Nutritional Therapy Association, Impacts of Chronically High Cortisol.

ALL ABOUT HORMONES			
HORMONES	**EXAMPLES**	**DERIVED FROM**	**FOOD SOURCES**
Amine hormones	• Melatonin • Norepinephrine • Thyroxine	• Modified amino acids	• Quality proteins
Eicosanoid hormones	• Prostaglandins • Leukotrienes	• Fatty acids	• Good fats (including EFAs)
Peptide and Protein Hormones	• Insulin • Glucagon	• Chains of amino acids	• Quality proteins
Steroid Hormones	• Cortisol • Testosterone • Estrogen/Progesterone	• Cholesterol	• Good fats • Unrefined complex carbohydrates
Thyroid Hormones	• TSH • T3 • T4	• Iodine atoms + Tyrosine	• Iodine • Quality proteins

Table 12.8. All About Hormones.

Pregnenolone is a precursor to the production of adrenal and sex hormones. Only the adrenal glands can remove and concentrate pregnenolone in the bloodstream. Pregnenolone or progesterone—instead of supporting sex hormones—can be shuttled to make more cortisol. Remember, the body prioritizes survival (cortisol) over making babies.

Pregnenolone can help make cortisol, depleting our sex hormone reserves. And when you take exogenous pregnenolone or progesterone, it will only support the stress response more, furthering the increase in cortisol production. It's fueling the chronic stress fire. This is why supplementing with hormone creams and supports when the cause is high, chronic stress (and increased

cortisol production), can irreparably damage the already exhausted body. Giving estrogen to women in insulin resistance can increase already high testosterone levels (reference Figure 12.9).

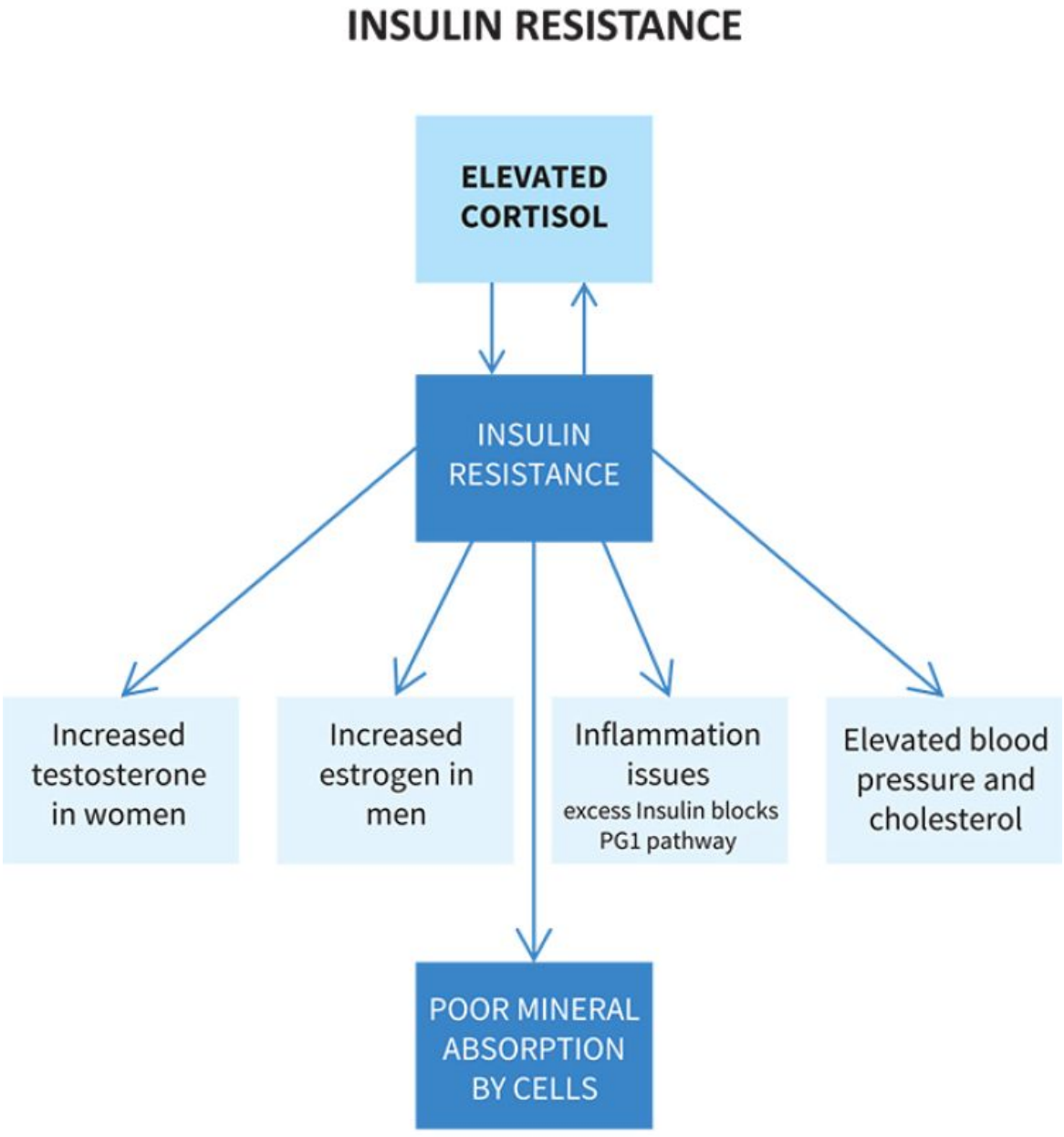


Figure 12.9. Insulin Resistance.

SYMPTOMS OF ENDOCRINE DISORDERS

The endocrine disorders represent four of the many hormones that are in the body. These four hormones are responsible for the majority of symptoms produced by endocrine disruptions.	Adrenal excess	Adrenal deficiency	Thyroid deficiency	Thyroid excess	Estrogen excess	Estrogen deficiency	Testosterone excess	Testosterone deficiency
• Acne	✓						✓	
• Asthma, allergies, or bronchitis		✓						
• Bruises easily	✓							✓
• Constipation	✓			✓				
• Dark circles under eyes		✓						
• Decreased libido	✓	✓		✓				✓
• Depression	✓	✓		✓	✓	✓		✓
• Diarrhea or loose stools			✓					
• Dry skin or hair				✓				
• Frequent colds or flus	✓	✓						
• Hair loss on head	✓						✓	
• Heart palpitations	✓		✓					
• High blood pressure	✓		✓	✓			✓	
• High cholesterol	✓			✓	✓	✓	✓	✓
• Hot flashes or excess sweating						✓		
• Increased facial or body hair							✓	
• Insomnia	✓		✓			✓	✓	
• Irritability	✓	✓	✓		✓		✓	
• Low blood pressure with dizziness		✓						
• Low body temp or cold intolerance				✓				
• Low energy in morning		✓						
• Low energy throughout day	✓			✓				✓
• Menstrual irregularities	✓	✓		✓		✓		
• Mental fog, memory loss		✓			✓	✓	✓	✓
• Muscle aches, muscle decrease	✓							✓
• Oily skin or hair	✓						✓	
• Osteoporosis	✓		✓		✓	✓		✓
• Puffiness in face, hands, and feet					✓			
• Thinning skin	✓							✓
• Urinary incontinence (leakage)						✓		
• Weight gain	✓			✓	✓	✓		
• Weight loss		✓	✓					

Table 12.10. Symptoms of Endocrine Disorders.

Another example is giving testosterone to men without effectively figuring out the root cause of testosterone deficiency. This can cause an increase in both dihydrotestosterone (DHT) and estrogen levels in men.

Perimenopause and Menopause

During perimenopause and menopause, the adrenal glands take over the main production of estrogen from the ovaries. The adrenals should be in a good functioning condition to take over.

If women are suffering from blood sugar issues, the perimenopause period will be challenging. Imagine a relay race: the ovaries have finished their lap and are now passing the baton to the adrenals to make estrogen.

If the adrenals are not in a condition to take over making estrogen, the adrenals will suffer even more. Remember, the endocrine system is a complex web, and just giving the adrenals extra estrogen is not going to solve the problem.

Frequently during perimenopause, women are told to take bioidentical hormones. While they sound great—because they are naturally derived substances from wild yams or soybeans and have biochemical structures identical to the hormones found in the body—they still require enzymes and activators to convert into functioning hormones.

There’s nothing natural about this taking place in a lab.

It shouldn’t be as commonplace to use supplementary hormones. You can always show the figures in this section to your primary care provider and ask if hormone replacement therapy is the right option. You might just be able to reverse some of the menopausal

symptoms by healing insulin resistance and lowering overall inflammation.

Use food as medicine and focus on gut healing. If standard care recommends a steroid or hormonal support, first consider eating a nutrient-dense carnivore diet, reduce stressors, improve sleep and lower inflammation. Remember to consider the complexity of the endocrine hormones.

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Chapter 13

Carnivore Cure Preparation

Give me six hours to chop down a tree and I will spend the first four sharpening the axe.

—Abraham Lincoln

PLANNING IS REQUIRED to be successful with the Carnivore Cure elimination diet. This chapter discusses some of the preparation and planning to help you on your journey back to optimal health.

Eating Disorders and Using Food for Comfort

Some consider elimination diets, such as carnivore, to be too restrictive and that it's really a disguised eating disorder. I suffered from an eating disorder for many years, and I am very mindful of this concern. I was in an eating disorder outpatient therapy program for ten hours a day while my six-month-old son was with my parents almost two thousand miles away. I was a first-time mom and my fears of failing as a mom became a reality. I was away from my son because I needed medical attention. To say that I understand what a severe eating disorder looks like is an understatement.

I take eating disorders very seriously. If you can't stick to a carnivore diet for a specific period of time and you start to binge on days of off-plan eating, this is more about you than the diet. You'll likely have the same tendencies with any diet. Off-plan eating is a particular problem at the end of the year (Halloween, Thanksgiving, and Christmas), as well as during birthdays, vacations, and special celebrations. Your environment has millions of cues. These cues

eventually trigger behavior, and over time these repeated behaviors become habits (see Figure 13.1).

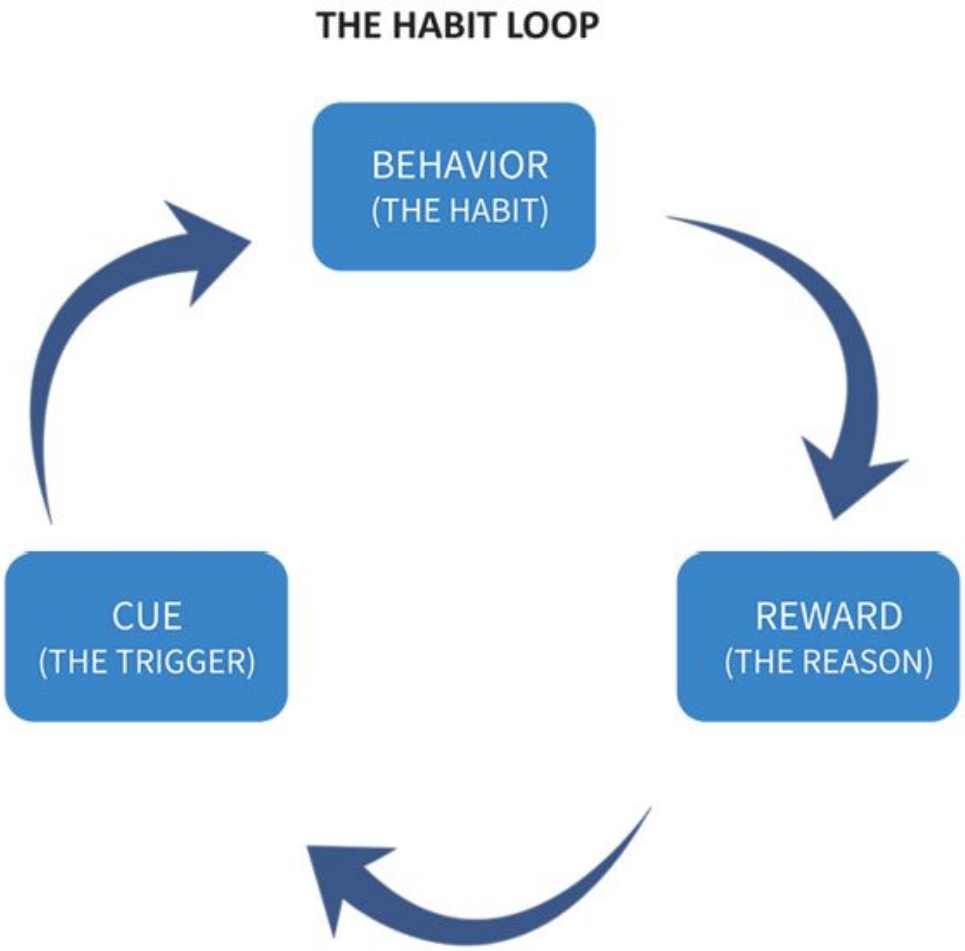


Figure 13.1. The Habit Loop.

Off-plan eating can happen on vegan diets, Paleo and ketogenic diets. Figure out why you ate something off your diet plan and what caused you to binge. This requires introspection and some uncomfortable digging, but therein lies the cause.

Why We Turn to Food to Cope

The body releases endorphins for pleasure. You also release dopamine when you simply start seeking a reward. When you decide

to binge, you get a hit of dopamine from the excitement.

The mind has a finite amount of decision-making capacity daily. If you have to make the same conscious decision every day for the same reasons, you will exhaust yourself from decision fatigue. In fact, the average person makes about 35,000 decisions every day and about 180 decisions per minute. No matter how rational and strong-willed you are, whenever you make a decision, you pay a physiological price on your net reserve of decision-making power.[305] By night, you have very few reserves left. This is why dieters struggle to remain compliant at night, even though they have not strayed during the day. They are exhausted from fighting temptations all day long.

To be efficient, we often run on autopilot. You don't think twice about which freeway exit to use when driving to work. In fact, on days you aren't working, you may accidentally get off at the wrong exit because your autopilot was taking you to work.

Understanding the concepts of autopilot decisions and decision fatigue is critical. Even as a child, we have been trained to seek food for comfort. When an infant cries, we try to nurse the baby: "Baby's probably hungry." Parents tend to endorse this food-as-comfort mentality. When a child does something good, we reward with lollipops. When there's bad news, we comfort with ice cream. We console with food, but we also support with food. We celebrate with food. We [insert any verb] with food. If we look closely at the foods we use to cope, we can see they have one commonality: sugar. It is not real food but sugary processed carbohydrates. Even chips are processed carbohydrates.

Some people who don't learn coping skills tend to turn to food more often than others. Some people use food as a coping mechanism

instead of another harmful coping mechanism (e.g., alcohol, drugs). The common thread is that at one point, the autopilot decision of turning to food (and its endorphin releases) becomes a harmful addiction. We need to feel the coping effects, but only to feel worse during withdrawal. We know it's probably better not to indulge, but we lose control and give in to the addiction of autopilot decision-making.

To break this cycle, introspection is required to break the physical addiction (the easier part) and the mental addiction. Figure out the cues that sent you to foods. Change these patterns and replace them with other solutions (habits).

If you struggle with some form of food addiction, consider your overall relationship with food, specifically with high-carbohydrate foods. When you are sad, do you turn to food? What about stress? Anger? When you celebrate, is food the first thing you think of? If you consider yourself a foodie, what food does that entail? Being aware is the first step because the most challenging part of solving a problem is accurately defining it.

To combat mental addiction, it is critical to have a body that is strong and nourished. You cannot fight mental and emotional food cravings if the body is having physical cravings for food. Nourish the body, so you are physically equipped to start changing your relationship with food.

Benefits of a Carnivore Diet

Anecdotally, just about every single medical condition has a story about healing by following a carnivore diet. Figure 13.2 shows some of the more common healing powers of a carnivore diet.

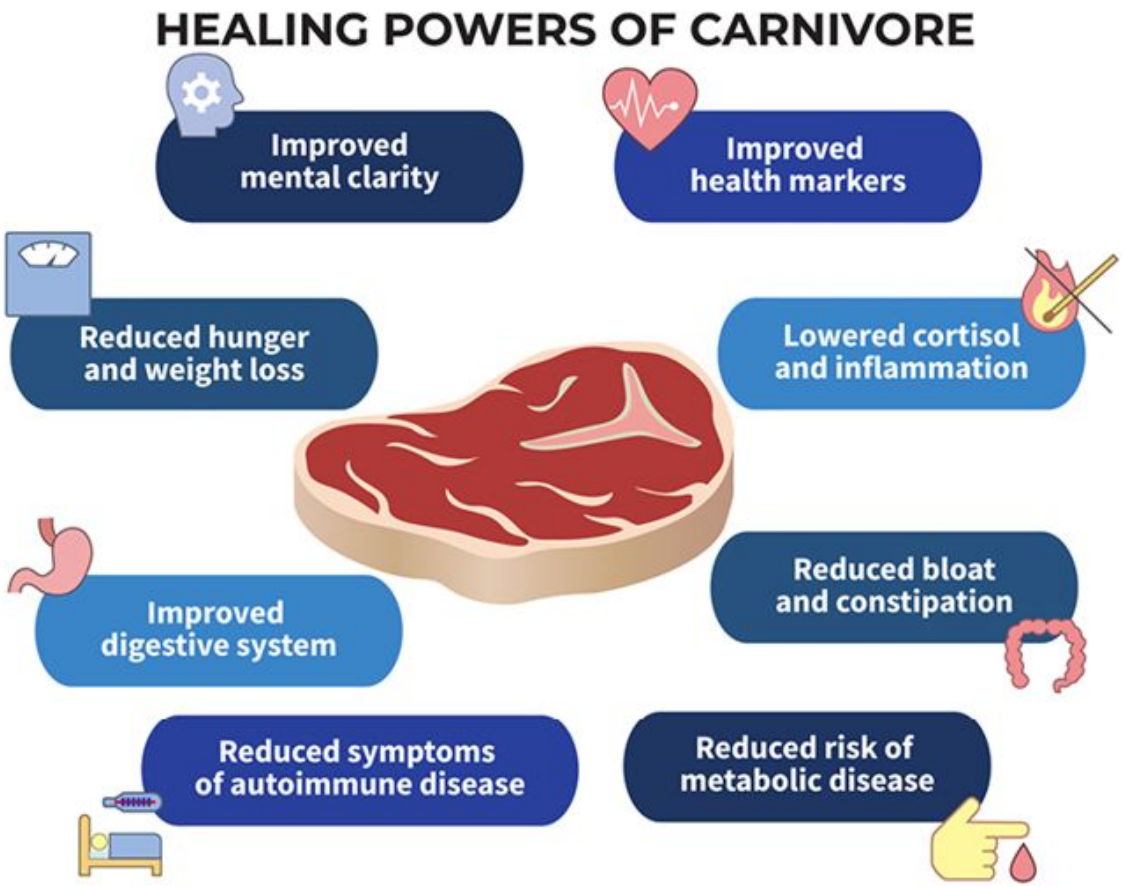


Figure 13.2. Healing Powers of Carnivore.

Longevity (Telomeres)

There has been an increasing discussion on telomeres. Telomeres are the end-caps of DNA that essentially protect the DNA from damage as the body ages.

While the research is still in its infancy, some researchers believe that shortened telomeres are a cause of aging and cognitive decline. Either way, shortened telomeres cause chromosomes to be less protected, unravel (think of the end plastic pieces of shoelaces), and contribute to genetic mutational damage such as Alzheimer's.

Many factors cause telomere shortening. Telomeres shorten every time cells replicate. While aging is a significant component of telomere shortening, some studies show the shortening varies from

person to person, and between men and women. You already know the damage of poor nutrition and stress.[306]

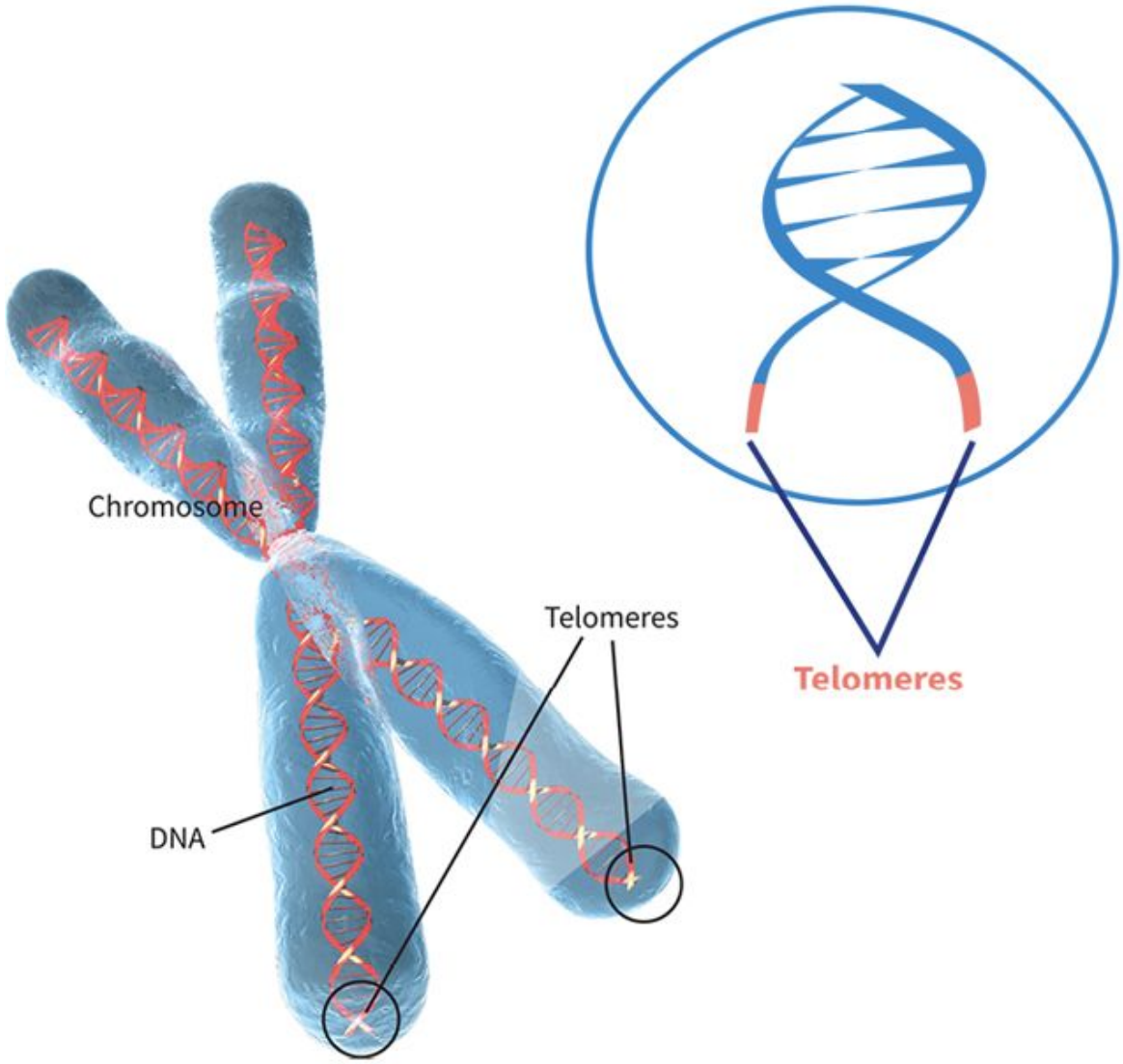


Figure 13.3. Telomeres.

In one study, there was a 550 bp difference in telomere length—equating to a 10-year increase in biological age when participants experienced a high level of stress, compared to participants with low levels of stress. The age of the participants did not affect results, and the difference is significant. Additionally, the telomerase activity was 48 percent less than in the high-stress group. A chronic decrease in telomerase activity (the enzyme that maintains telomere length)

contributes to accelerated telomere shortening.[307] One way to prevent the shortening of telomeres is by activating the enzyme telomerase. Without telomerase, chromosome ends will naturally shorten with each cell division.

While the research is still in its infancy, some ways to support and active telomerase is by extreme breathing, intermittent fasting, and meditation. In one study, a meditation retreat showed improvements in cellular longevity and positive changes in telomere length. The people who saw increases in telomere length from their initial baseline were the people who tended to think more positively or felt positive emotions.[308]

If you don't enjoy meditation, you can try yoga or any activity supporting the mind and body. What's essential is being able to move the body and practice mindfulness. Mind and body activities restore and activate vagal tones—the variability in a person's heart rate while inhaling and exhaling (part of the rest and relax state). Ideal vagal tones show a slightly increased heart rate during inhalation and decreased heart rate during exhalation.[309] This is why breathing techniques are effective. Slow, deep breathing techniques stimulate the vagus nerve (manages vagal tone), decrease blood pressure, and lowers heart rate. Lower vagal tone is associated with inflammation, low mood and cardiovascular disease.

When lifestyle is changed, studies have shown that telomeres became longer by 10 percent. They continue to lengthen as the lifestyle continues to change. Lifestyle changes included diet, exercise, stress management, and experiencing genuine social connections and intimacy.[310]

Another study showed that vitamin D could help activate stem cells in the gut, and people with the highest levels of vitamin D in their

blood had higher telomeres. As I discussed in the vitamin D section, the body is more complex than simply increasing supplementation of vitamin D. What we do know is that supporting the body to have adequate amounts of vitamin D is critical.[311] Smart sun exposure and rich vitamin D foods are the best options.

What to Expect on Carnivore Cure

I've reviewed nearly 500 foods for the Carnivore Cure elimination diet. These foods were reviewed for antinutrient content, glycemic impacts, histamine levels and inclusivity in other elimination diets (FODMAP and AIP). As the Carnivore Cure elimination diet evolves, the food list will be updated. If you are interested in the full Carnivore Cure food list, go to www.carnivorecure.com/protocol.

The Importance of Preparation

In my management consulting days, I led multi-million-dollar projects that had several project phases: initiate, plan, execute, test, and support. These phases included tasks that supported big milestones like initiating a project, planning the project, or executing the project. Each project had variations of each phase, but there was one commonality in all projects. The projects that allocated a significant amount of time and budget in the initiate and plan phases were by far the most successful during the execution and test phases. These initial planning phases set the stage and foundation for the rest of the project.

If you don't know where you are, how do you know where you are going? Even if you knew where you wanted to go, how would you know how to get there?

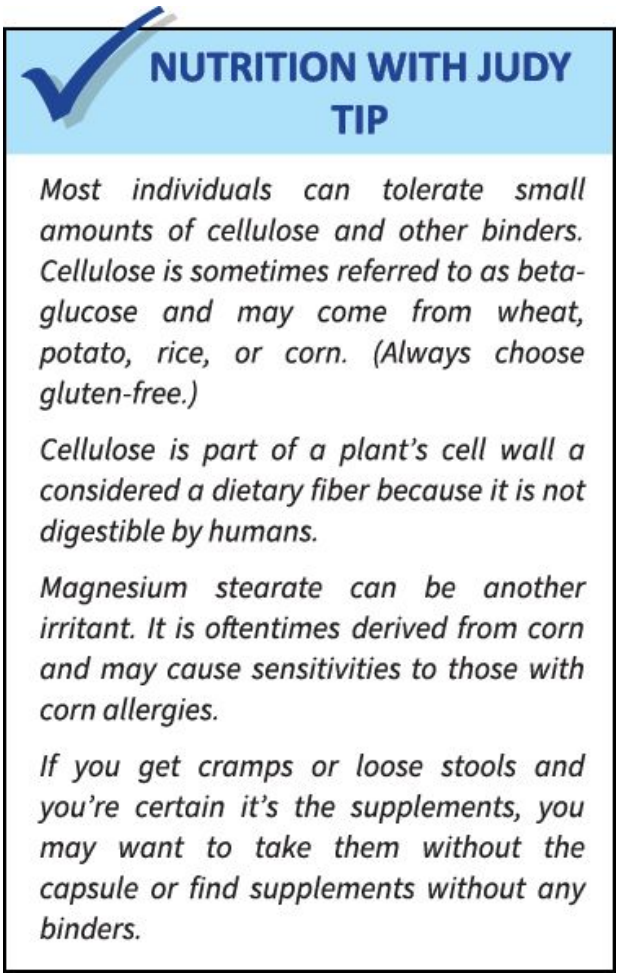
This is why large corporations spend significant amounts of time and money on developing business roadmaps—a pictorial view of where

the organization is going and how to get there. No matter the trajectory, companies look to the roadmap to ensure they are staying the course.

In our personal lives, why do we plan day-to-day vacation activities? Because the goal is to have a great vacation, and by proper planning, you are more likely to achieve that goal. When you embark on a new way of eating, proper planning may be the difference between success and failure.

Bloodwork and Functional Tests

Having several data points for your health is beneficial. The bloodwork of many of my clients shows they have normal ranges (e.g., fasting glucose, cholesterol). Yet when they perform the organic acids test or my symptom burden test (a symptom test I use with all my clients to see how their bodily systems are doing), the results show areas in the body that may need additional support. Without considering economics, I'd recommend getting all tests and then retesting about 90 days later (assuming you were eating the Carnivore Cure way for the full 90 days).

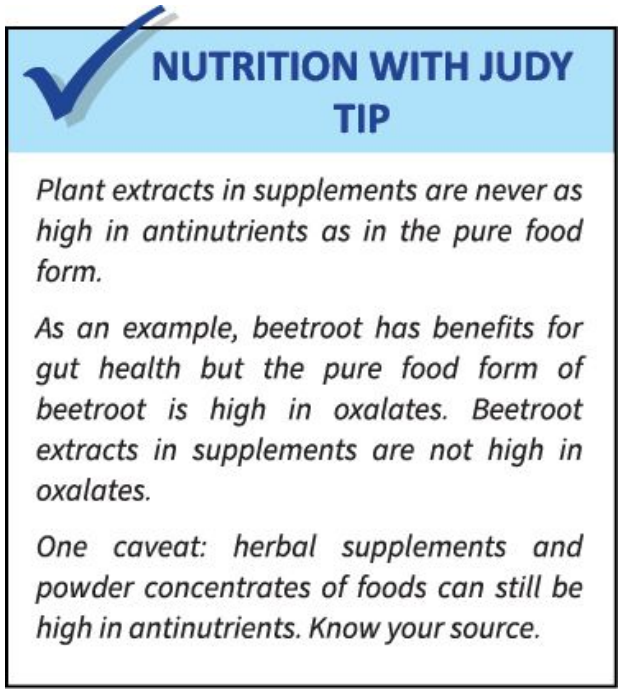


Your bodily symptoms are the best indicator of something being imbalanced. If you have gut issues, or if you think you have candida or bacterial overgrowth in your small intestine (SIBO), a combination of my symptom burden assessment, the organic acids test, and homocysteine bloodwork will provide insight. From there, additional digging can be done with a comprehensive stool test. As the gut heals and the diet is optimized, the goal is that these tests are not needed.

My list of recommended health tests and gut imbalance markers are available for download. You can get more information about Carnivore Cure bloodwork at www.carnivorecure.com/resources. Use the information as a resource to ask for guidance from your own trusted medical practitioner.

Medication and Supplements

One goal of Carnivore Cure is to be supplement- and medication-free. You'll have to work with your medical practitioner to change medications over time safely. Most of my clients have decreased their need for prescription medications and have reduced their use of healing supplements in less than six months. A thoughtful practitioner will keep in mind that your ranges on a standard blood panel will vary from someone following a standard American diet.



Sometimes we do need to take supplements, especially if we have gut issues or have been malnourished for years (undereating or eating nutrient-poor foods). For example, adrenal glandular supplements can support you while working on healing adrenal imbalances. But even an adrenal glandular supplement should not be taken long term. When we take too many supplements, we break the body's ability to find a natural point of balance. Everything works together in our body, and we should focus on finding the cause of the deficiency, rather than supplementing the deficiency. Our body uses

all components to work together for balance. Often taking a calcium supplement won't change low calcium levels.

Figure out what is best for your health, not just because you are trying to fit target ranges. No one can definitively tell you that the target ranges are the right ranges.

Before medicating, get to the root cause.

Digestive Support

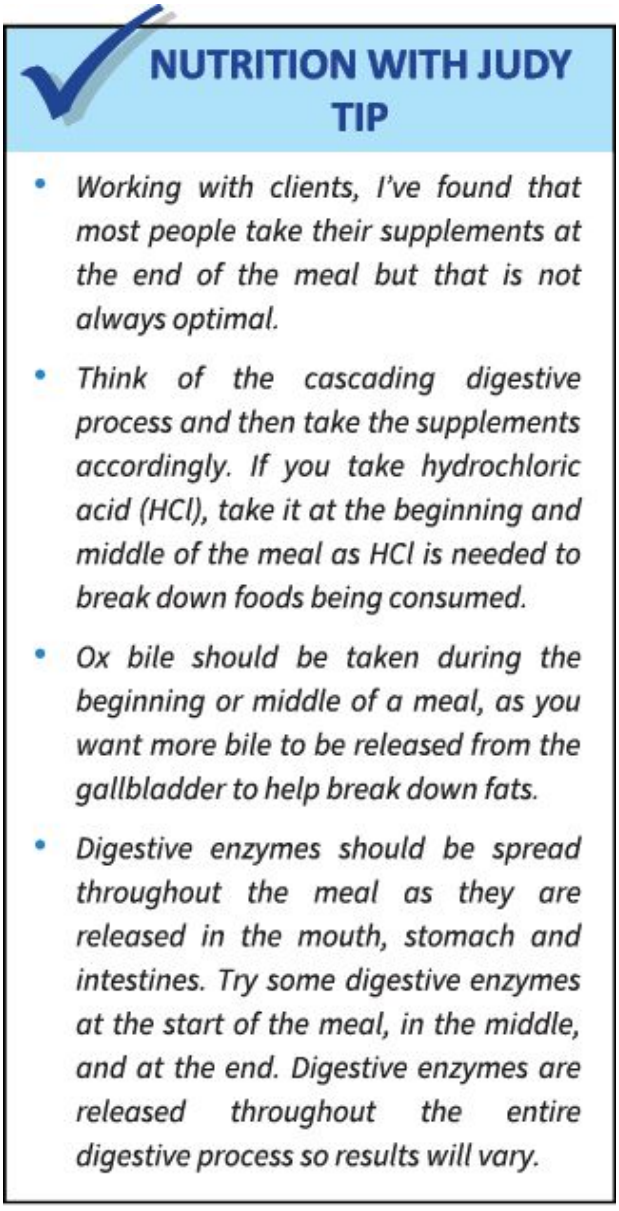
If you suffer from persistent physical symptoms, you may need temporary supplemental support. I've talked about how most people have low stomach acid. Even if you are eating mostly meat and fat, you may initially need to take digestive enzymes and hydrochloric acid with meals to break down foods and absorb the nutrients. Table 13.4 provides a list of general gut-healing supports.

SUPPLEMENTS FOR GUT HEALTH	
Sometimes healing the gut and rebuilding the gut lining requires additional support.	
Betaine HCl with pepsin	• Helps increase stomach acid and the pH balance of the stomach acid. • Pepsin is an enzyme that helps digest proteins. • Without adequate stomach acid, nutrients are less absorbed and proteins become harder to digest.
Digestive enzymes	• Digestive enzymes are released throughout the entire digestive process. Each respective digestive enzyme, helps to break down proteins, fats, and carbohydrates.
(Spore) Probiotics	• Helps restore beneficial bacteria and removes harmful strains in the gut microbiome.
Zinc	• Needed to make HCl. Zinc helps support the immune system and strengthens the intestinal lining.
L-Glutamine	• An essential amino acid that is anti-inflammatory and helps repair the intestinal lining.

Table 13.4. Supplements for Gut Health.

If you followed a low-fat diet or have had your gallbladder removed, digestive support and bile salts can make the difference when adhering to a high-fat diet. A 42-year-old female client was

vegetarian and consumed no animal proteins for years. When she started consuming sixteen ounces of meat a day, her energy tanked. After taking the organic acids test, she found that she wasn't properly breaking the proteins into amino acids. With some digestive aids, some acetyl-L-Carnitine, and eating two meals a day (instead of one), she regained her energy levels. She now only takes fish oils and probiotics for maintenance.



Another client had a similar story, as her diabetic condition required her to consume a higher fat and lower protein ratio per meal. When

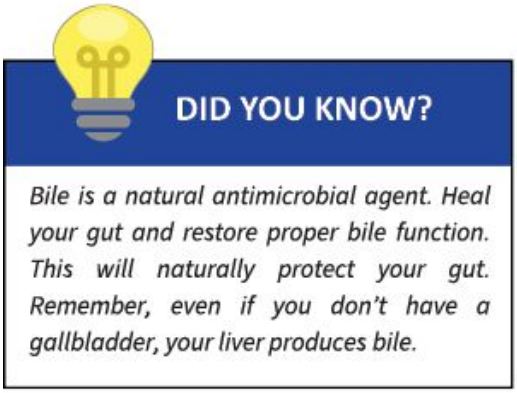
she had her eight ounces of steak for lunch, she included additional tablespoons of butter. This client had to take digestive enzymes to help manage the extra fat consumed (otherwise, she was having loose stools).

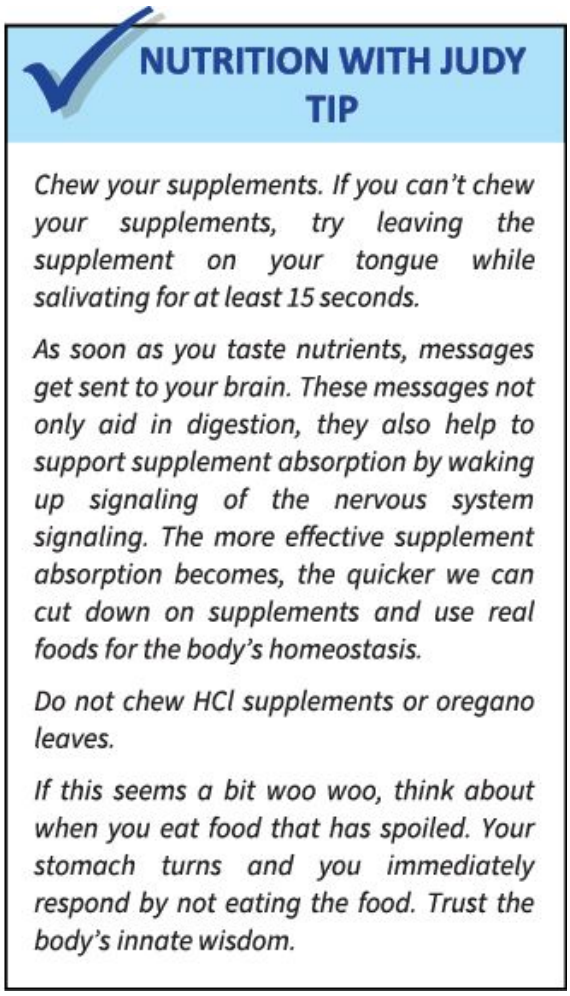
A gut-healing protocol in tandem with a carnivore diet can help expedite the healing process for many. The gut is the foundation of health. Remember, the digestive process is where the body processes, breaks down, and absorbs nutrients. Any imbalance in this process will ultimately affect optimal health.

As the body heals from the removal of toxic foods, the gut can repair with nutrient-dense meats and digestive supports. The eventual goal is to heal the gut, absorb nutrients, and let the body run effectively on its own.

Spore Probiotics

Almost everyone needs more stomach acid and a dose of good gut bugs to repopulate the system (while killing off bad gut bugs). While you may not have taken any rounds of antibiotics recently, if you consume any genetically modified foods (treated with glyphosate), or foods that act like antifungals or antimicrobials, you are consuming small doses of gut-killing herbals and toxins.





Most of my clients have already tried a probiotic supplement. When I ask my clients if they felt benefits—most say no— it's likely because most market probiotics contain only lactobacillus and bifidobacterium. These are often single-strain, single-effect probiotics that have a difficult time surviving the harsh environment of the gastric system. Sometimes the dead bacterial debris can still stimulate metabolic changes in the body, but these are often short-lived.

Soil-based bacteria is crucial for gut health and a properly functioning immune system, but with vegetables, triple washed and top-soil depleted of nutrients, we rarely get these soil-based bacteria in foods. Companies are making soil-based organisms, but the jury is still out on the safety and efficacy of these products.

Spore-based probiotics are not the same as soil-based bacteria. Spore-based organisms are gut commensal organisms—they are native to the gut—and are uniquely built to survive harsh environments like the digestive system. This allows them to colonize in the gut effectively. Spore-based probiotics allow for 100 percent survivability—the bacteria emerges from the spore alive, multiplies and begins healing the gut.[312] In Figure 13.5, you can see some of the benefits of probiotic supplementation from clinical studies.

If your probiotic requires refrigeration, I'd question its efficacy. If it can't survive room temperature, how will it possibly survive stomach acid?

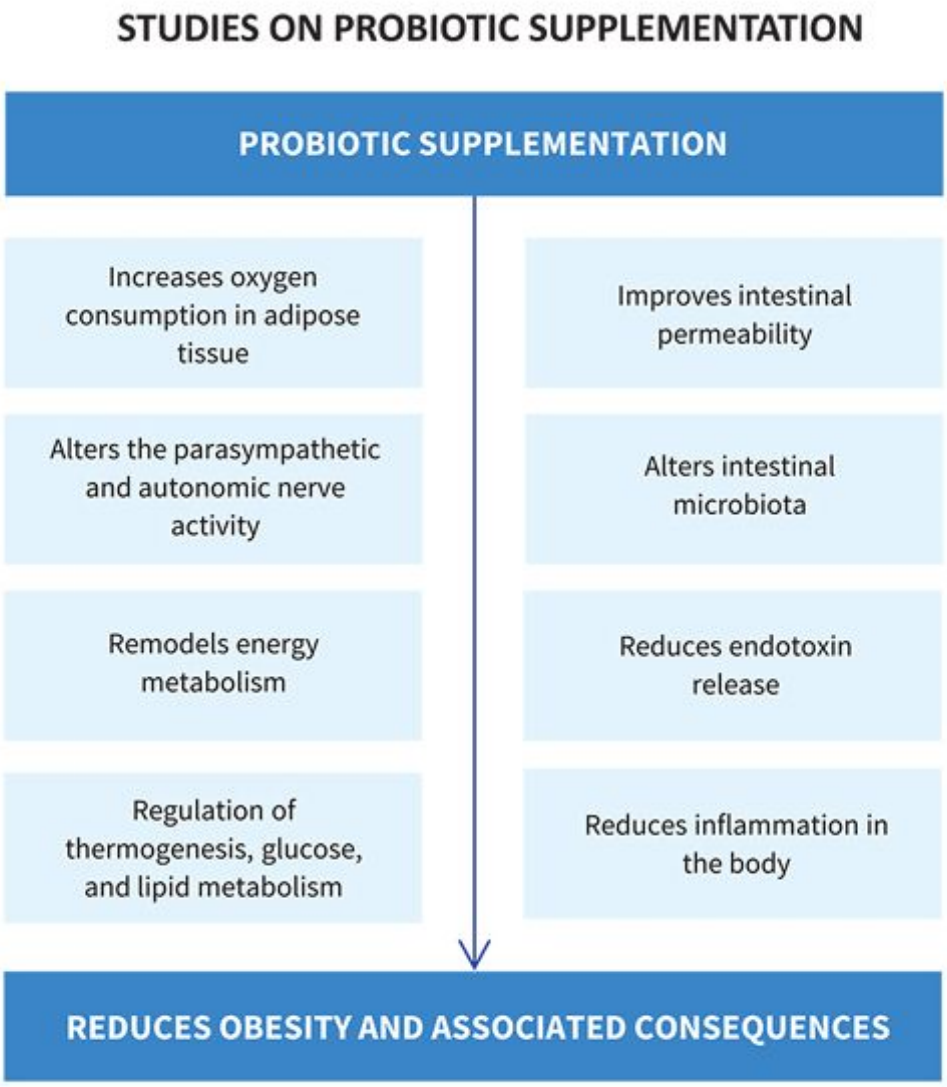


Figure 13.5. Summaries Studies on Probiotic Supplementation.

Actionable Tools and Tips for Successfully Following Carnivore Cure

The following tools are supports that will help you to find food freedom and healing on Carnivore Cure. There are many tips and tricks that you can use. Put in the preparation work and plan. Then put these tools into action.

Undertaking a Mental Fitness Challenge

I had the honor of leading a #Carnivore75Hard mental fitness community challenge during the 2019 holiday season. It was six weeks of eating a carnivore diet without a drop of sugar or sweetener. It was difficult, but that was the point of the challenge. It was seventy-five days of only animal-based foods during the most challenging time of year. (Halloween, Thanksgiving, Christmas and New Year's Eve). But if you can make it through seventy-five days of the most sugar-filled holidays of the year, what can't you do in life? [313]

The challenge had four other components: healing (fasting), movement (including outdoor exercise), mindfulness (three daily gratitudes), and community (complimenting a person in real life or performing a random act of kindness). #Carnivore75Hard encompasses the entire mind, body, and soul. You cannot focus on nutrition without adding daily movement and reducing daily stress.

I recommend joining the #Carnivore75Hard community if this is the first time you are learning of this challenge. The community challenge had over five thousand participants, and while not everyone finished, it showed the heart and desire of people wanting to take back their life and get back to optimal health.

If you have participated in the #Carnivore75Hard community challenge, some of these tools will be familiar, but it is beneficial to revisit and sharpen every single tool in your toolkit to get closer to optimal health.

A quick thank you to Andy Frisella, the founder of 1st Phorm and a motivational speaker, for creating the original 75 Hard program. Without his initial motivation, I may have never been inspired to make #Carnivore75Hard.[314]

Knowing Yourself

Get to know yourself. You must understand who you are, how you function, and what motivates or triggers you to act. You need to understand how you are so that you can figure out the best course of action.

From the teachings of Carol Dweck (details in Figure 13.6), we must strive to have a growth mindset. A growth mindset is one of the key factors in implementing long-term change and ultimately living your best life.

FIXED MINDSET VS GROWTH MINDSET

Which one are you?

I believe that my **[Intelligence, Personality, Character]** is inherent and static. Locked-down or fixed. My potential is determined at birth. It doesn't change.

I believe that my **[Intelligence, Personality, Character]** can be continuously developed. My true potential is unknown and unknowable.

FIXED MINDSET		GROWTH MINDSET
• Something you're born with • Fixed	**SKILLS**	• Comes from hard work • Can always improve
• Something to avoid • Could reveal lack of skill • Tend to give up easily	**CHALLENGES**	• Should be embraced • An opportunity to grow • More persistant
• Unnecessary • Something you do when you are not good enough	**EFFORT**	• Essential • A path to mastery
• Get defensive • Take it personal	**FEEDBACK**	• Useful • Something to learn from • Identify areas to improve
• Blame others • Get discouraged • Avoid failure • Desire to look smart • Avoids challenges • Stick to what they know • Feedback and criticism is personal • They don't change or improve	**SETBACKS**	• Use as a wake-up call to work harder next time • Desire continuous learning • Confront uncertainties • Embracing challenges • Not afraid to fail • Put lots os effort to learn • Feedback is about current capabilities

Figure 13.6. Dweck, Carol, *Mindset*, (2006).

The section gives you many tools to help you know yourself while setting up goals, intentions, and accountability measures. The more effort you put into this section, the better your results can be. Studies show that the more planning and visualizing success is involved, the higher chances of real success.

Knowing Your 'Why'

Everyone says, "Know your 'why'—your reason or motivation for wanting change. But have you ever sat down and taken some time to figure out your why? Why do you want optimal health? Why do you want to try a carnivore diet? Discover your why. Simon Sinek is a great motivator to help you dig deeper.

Take the time to figure out your why. Go somewhere and write in a journal. Find out why you live and what motivates you. What if you died tomorrow? Did you fulfill your why? Are you living daily to fulfill your why?

Setting Goals

Take time to think about your short-term goals. These should align with your why. You need goals that are actionable and measurable that will help support your overarching whys. These are shorter-term goals, such as, having better health markers at the next doctor's visit. Then think of your long-term goals. These can be longer-term goals like reversing type 2 diabetes.

What are your short-term and long-term goals?

Winning Your Day

What must you do daily to reach your goals and live out your ultimate why?

What are three to five things you can implement daily to ensure you are heading toward your goals? What are three to five things you

can write down on your must-do daily list? You can modify these daily, or you can have the same ones until they become habits. Habits can take anywhere from two weeks to months to form. Frequency is a big component of habits, which is why winning your day (daily wins) is a must. Once a daily win becomes a habit, you can incorporate another item on your list that gets you closer to your long-term goals.

This is purposeful living. If your daily wins line up with your goals, you will be supporting your why every day.

Using Sugar and Sweeteners

Why do you want to cut out sugars and sweeteners?

You know how addictive, and physically damaging sugars and sweeteners are to the body. Sometimes it's helpful to write down all the harm it does in your body, your relationships, and in your life.

Write it down. Read your list when you are struggling or craving sugar. What do sugar and sweeteners do to you? To your family? To your life?

Riding the Cravings Wave

If you have cravings, try to ride the wave. Usually, cravings last less than ten minutes. Addiction experts call it riding the wave. Sometimes talking yourself through the cravings can help. Why are you feeling these cravings? Did you eat enough today? Are your cravings emotionally driven? Ask yourself many questions, and see if you just need to eat some more meat.

We often misread cravings because we are hungry, emotional (angry), lonely, or tired. When we are emotionally charged, it's hard to calmly process all that's going on in the body. This is when physically releasing some of the energy first can be helpful. Spring

for a couple of minutes or do some deep breathing techniques. Once you are calm, your cravings for sugar and sweeteners may just be gone.

If your cravings don't go away, I'd look at the "if this, then that" options next.

Using 'If This, Then That' Statements

When you replace sugar and other forms of addictions, you must find real alternatives. You know that sugar addiction is real. You know that when your emotions are in a good place, it is easy to continue the way of life that allows you to be your best self.

But what about the hard times?

When your emotions are running high, and you can no longer turn to sugar and comfort foods, what will you do? You need to figure this out. Create "if this, then that" statements to find solutions. When you get into these highly emotional states (nonlogical), you can look at your "if this, then that" planning sheet, and do what's written down instead of thinking of ways to cope without food.

Here are some examples. *If* my craving lasts longer than ten minutes, *then* I'll try eating some meat. *If* I have sugar cravings, *then* I'll go for an outdoor walk (or a similar self-care activity). You have to know what self-care activities work for you. Breathing techniques make help John, and dancing to music may help Jane. Remember, exercise reduces anxiety, and outdoor walking also changes the environment. The cue has now changed.

Visualizing

Visualizations are the best tool you can use to create pathways in the brain and then use them in highly emotional situations. If you plan three different courses of action when you're confronted with

[insert desired food], it becomes that much easier to navigate the murky.

Some studies show that when we see someone playing an instrument, compared to merely imagining the music in our heads, our brain lights up in the same way. The brain doesn't seem to be able to differentiate between reality and the imagined. So, imagine success.[315]

Mentally practice the situation. You know what you don't want. But have you considered what you do want? You know you don't like being overweight. You know you don't like sugar addiction and the anxiety and depression that come with it. You know you don't like being sick.

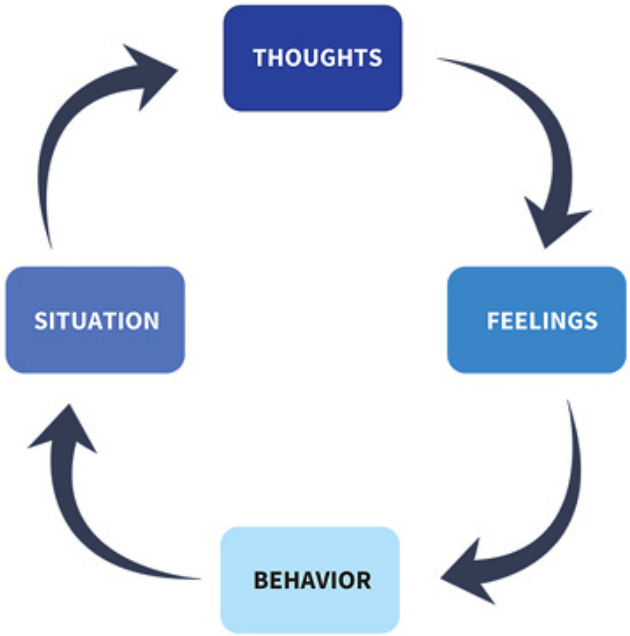
But have you visualized what you *do* want? Have you visualized being healthy? Have you visualized being free of sugar? Have you visualized being free of symptoms?

In one year, five years, ten years, how do you see your life? Visualize your future self. Where do you see yourself? How do you see yourself? Visualize you in your life. Write it down. Make vision boards.

Setting Your Intentions

What are your daily, weekly, monthly, and yearly intentions?

Intention relates to visualizations. Every morning you can start with quiet time, meditation, and setting your intentions for the day and week. Start the day with what you want to achieve. Make each day purposeful and meaningful.



Money can never buy health and time. They are the most precious gifts you have. Don't take them for granted.

What is your intention?

As an added benefit, this will support your telomere length.

Oftentimes your thoughts and feelings control your behaviors and actions. Be mindful of the thoughts you are thinking. This includes what you read, what's part of your social media feed, and what you watch. Protect your mind.

Banishing Automatic Negative Thoughts

We are wired to protect ourselves, and we sometimes do this with automatic negative thoughts. Thoughts happen so quickly that the subconscious mind fails to notice them, but they can still affect our mood. These are called automatic negative thoughts and are often negative and irrational. Identifying these negative thoughts and replacing them with new rational thoughts can help alleviate the negative ones.

Negative thoughts can cause chronic stress and can affect your health and even alter your brain. Every negative thought can alter your brain's chemical makeup, creating a cascade of adverse health effects.

Here's an example:

> *Trigger*: I made a mistake at work.
>
> *Automatic negative thought*: "I always make mistakes. I always mess up. I'm going to get fired."
>
> *Changed thought:* "I messed up, and mistakes happen. This will pass. It always does."

Entering Cognitive Behavioral Therapy

Cognitive behavioral therapy (CBT) and dialectical behavior therapy (DBT) offer many other life tools and skills. These psychotherapies help to manage emotions and support conflict. CBT and DBT help to change your mindset and, most importantly, help you be aware of your thoughts and feelings. Everyone benefits from therapy. It's hard work getting to know ourselves, but it often helps us break free from areas of known and unknown pain and trauma.

Some CBT and DBT tools I recommend looking into are wise mind, black and white thinking, fortune-telling, catastrophizing, interpersonal effectiveness, distress tolerance mode, and radical acceptance.

Seeking Community Support

Studies show the immense power of the community. It's so powerful that if you want to adopt certain habits, merely surrounding yourself with people who already have those habits will significantly increase your chances of adopting these new habits, long term.[316] Designate people who will help you in specific ways. Some days you need a

good reality check. Find the person who will give you tough love. Let them know their role during Carnivore Cure. If you ever waiver, you are asking them only to offer tough love.

If you have a friend who's supportive but in a way that can sabotage your change, either stay away or meet them in less risky situations. If your friend comforts you by saying, "it's okay to have a day of eating off-plan," in this situation, this friend is not helpful. Figure out the proper community support that will help you to stay focused and committed.

Figure out how much you want to share with the community around you. Some may not want to support a meat-based diet. This is more about their cognitive dissonance than about you—if they agree that a carnivore diet is healthy, they will inherently have to question their way of eating.

Using Social Media Accountability

Announcing changes on social media tends to lead to higher rates of success. This is why diet bets are popular and successful.

If your community is also through social media, cut out the people who clutter your feed with junk and negative thinking. Life is hard enough. You don't need constant reminders that you're not good enough. Surround yourself with the people you want to be.

Knowing Whether You Are an Abstainer or Moderator

In *Better Than Before*, Gretchen Rubin talks about abstainers and moderators and how we typically fall into one camp or the other, especially when it comes to temptations. You can be an abstainer in some areas and a moderator in others, but usually, people fall into one category.[317] Table 13.7 provides more details on being an abstainer or moderator.

Most of my clients find it easier to give something up altogether than to indulge moderately. If they try moderation, they exhaust themselves debating, “Today or tomorrow? Twenty grams of carbohydrates or thirty grams? Save carbohydrates for something healthier (vegetables) or for sugar-free snacks? Diet soda?”

If you know that one piece of chocolate always turns into two and then a few more trips to the pantry, you are probably an abstainer. Standard nutritional advice is everything in moderation. But what if you can’t control yourself around sugar? What if you are more susceptible to having an addiction to sugar? In that case, moderation is torture. The only way may be abstinence.

Standard care would never recommend moderation for drinking, drugs, and other substances that turn into addictions. Abstinence is always key.

ABSTAINER VS. MODERATOR

When it comes to temptations, author Gretchen Rubin believes that most people fall into the abstainer or moderator category.

ABSTAINER	MODERATOR
• Abstainers find it easier to give something up entirely than doing it in moderation • If abstainers try to do things in moderation, they waste a lot of energy justifying why they should or shouldn't indulge • With abstainers, giving them any small allotment of carbohydrates causes the mental battles and energy for decision making to start	• Moderators get anxious at the thought of *never* having or doing something again • If moderators try to abstain, they feel trapped and rebellious • Moderators do better with knowing there's a little bit of carbohydrates they can consume and are able to portion control. They struggle to stay compliant if the situations call for complete abstinence

The mind likes to run on autopilot because there's only a finite amount of self-control and decision-making power in a day. Autopilot allows us to go about the day and use energy for more difficult decisions. This is often why people binge at night, since the mind is exhausted from the willpower and decision-making used through the day.

If you are an abstainer and abstain fully, you take out the decision-making and willpower from addictive foods. There's no more of the "should I eat this or that" decision-making process.

For an abstainer, 99% abstinence is unbelievably difficult but 100% abstinence is easy.

Figure 13.7 Rubin, Gretchen, *Better than Before,* (2015).

When you know carbohydrate foods provide nutrient-poor levels of nutrition and may contribute to metabolic disease and antinutrients, it's easier to understand that abstinence is key. If you know you are an abstainer, one piece of chocolate may never work. But seeing chocolate as a nonfood may just make the difference to eat meat-based.

If you are a moderator, then the picture is a bit different. Moderators may not get triggered by sugars and carbohydrates, assuming their bodies can physically tolerate these foods.

Remember, when the body is nourished, it's less about the body but more about the mind. You don't want both body and mind fighting you. It's a lose-lose situation.

Understanding Your Motivation to Act

Scientists, psychologists, and clergy have tried to figure out how and what motivates us to act. Companies research activity trends and our buying patterns because it's the best way to advertise and capture buyers.

Rubin talks about personality types in *The Four Tendencies.* By knowing your tendency and motivation to act, you may be that much more successful in reaching the goal you set for yourself. There are four tendency buckets, and most people fall into the obliger and questioner categories.[318]

I have provided a summary of all the tendencies in a bonus guide. If you want to learn more about the different tendencies and a real-life example, you can get it at www.carnivorecure.com/behavior.

Getting the Environment Ready

Hide the scale. While you may lose weight on Carnivore Cure, the priority is always healing and optimal health. I always recommend that clients stay off the scale. Not losing any weight after sticking to a new diet for several weeks can be discouraging.

But there are other ways to see weight loss and body composition changes. Sometimes you lose inches around the waist before you lose on the scale. Consider how your clothes fit. Take some before-and-after pictures. Don't focus on the scale. Even better: stay off the scale.

- *Focus on healing.* Weight management can always be tweaked later. The body needs nourishment, and you do not want to focus on a number if you are (temporarily) metabolically impaired.
- *Take before-and-after pictures.* No one likes taking before pictures, but many people regret not taking enough pictures when they lose weight and get back to optimal health. Take pictures weekly, in the same pose. You will appreciate the journey you've been on when you get to the after.
- *Clean out the pantry and fridge.* It's time to clean out the refrigerator and pantry. Go through all your foods, seasonings, oils, and throw away (do not donate—throw away) anything that could be a trigger. No processed food is so expensive that you cannot throw it away. Don't donate because no one should be consuming inflammatory seed oils and processed carbohydrate junk foods.
- *Meal prep and store frozen foods.* Plan your meals ahead of time. Sometimes you are ravenous and will eat whatever

is in plain sight. This is why packaged, and processed foods are so palatable.

Pick a day for meal preparation. Cook several pounds of ground beef, strips of bacon, or steaks and freeze them for later use. Do this on a Saturday or Sunday and prep all the meat you will eat for the week. Have some emergency homemade frozen meals on hand. Never give yourself an excuse to eat processed foods because “I was hungry, and there wasn’t anything to eat.”

- *Mentally prepare yourself.* Everyone is motivated in the beginning. You’ve done all the prep work. You are excited for change. But in less than one week, things will begin to get hard. Ask anyone who has attempted #Carnivore75Hard. If you are used to consuming sugar and sweeteners, the first couple of days will seem fine, but by day three, when your glycogen stores are depleted, you will begin to feel tired, and the cravings for carbohydrates will set in. You may feel low energy and irritability. This period is often called the low-carbohydrate or ketogenic flu. During this period, motivation starts to waver.

The best option is to eat an abundance of meat, stay hydrated and pay attention to your electrolyte intake. As the body releases its glycogen stores, it also releases water and electrolytes. Your body has to switch from using sugar as fuel to fat as fuel. The body needs a little time to relearn how to use ketones effectively. If you were a sugar burner before starting the Carnivore Cure, days 4 to 7 are probably the most challenging. It gets worse before it gets good.

The best thing to do is to keep focusing on eating nutrient-dense meats—all the kinds that you enjoy. Don’t worry about calories. Don’t

worry about weight fluctuations. Focus on adapting your body to consuming fats.

In the second or third week, many of you will want to give up. Cravings for comforting carbohydrate junk foods become fairly intense. The cravings are worse during periods of stress. Some of you may start to dream of foods that you are abstaining from. Your mind is playing tricks on you. The Carnivore Cure symptom calendar in Table 13.8 depicts what to expect each week. The following are some symptoms and emotions you may experience when starting the Carnivore Cure protocol. Results will vary based on personal situation (e.g., moderator, low carb, diabetic, obese, disordered eating, etc.)

But you have prepared yourself for these moments. Revisit your why. Remember why you started and what you are trying to heal. You know what life before Carnivore Cure was like, and it was bad enough that you chose to embark on a journey to better health.

By the third week, some of you may be suffering from food boredom. Meal-planning options and carnivore recipes and cookbooks are available. You can find them at www.carnivorecure.com/resources.

Once you begin to use ketones effectively, your blood sugar and insulin regulate, you start sleeping better, and you'll know you're on the journey to optimal health. Keep going—it only gets better from here.

At the end of the Carnivore Cure protocol, you may feel a bit of anxiety or even panic: "What do I do next?" That's the beauty of this way of eating. You now have your customized baseline and tool kit to keep you successful. You will know what foods work to support you, and you alone.

CARNIVORE CURE SYMPTOM CALENDAR

The following are some common symptoms and emotions you may experience when starting the Carnivore Cure protocol. Results will vary based on personal situation.(e.g., moderator, low carb, diabetic, obese, disordered eating, etc.)

START OF WEEK 1	MID-WEEK 1	END OF WEEK 1
• Excited • Inspired • Anxious	• Low carbohydrate flu • Low energy • Low mood (try electrolytes + rest)	• Low energy • Poor sleep

WEEK 2

- Symptoms can worsen and doubts about the diet may start to creep in.
- Poor sleep and leg cramps are possible. (Try magnesium spray)
- Minimal weight loss on scale can cause discouragement.
- Bingeing dreams on "cheat" foods can occur.
- May continue to have low energy and low mood. Symptoms may start to improve.

WEEK 3

- Symptoms may start to improve.
- Possible weight loss. Possible changes in physical body.
- Better sleep.
- Better energy, performance, overall mood, and less brain fog.

WEEK 4 AND BEYOND

- Symptoms continue to improve. Start showing signs of fat adaptation.
- Possible food fatigue. Possible desire for plant foods and carbohydrates.
- Ready for reintroductions (wait until no food reactions or physical symptoms).
- Some individuals get frustrated at month 3 and month 6, especially if weight loss or physical symptoms aren't where they expected them to be. Consider documenting with a food and mood journal. Sometimes tracking for a period of time provides more insight into what could be going on.

Table 13.8. Carnivore Cure Symptom Calendar.

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306 Bernadotte, Mikhelson, and Spivak, “Markers of Cellular Senescence,” 3–11.; Blasco, “Telomere Length, Stem Cells and Aging,” 640–49.
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317 Rubin, *Better Than Before.*
318 Rubin, *The Four Tendencies.*

Chapter 14

How Much to Eat and Drink

You have to trust your body to take care of you.

Unknown

ONE OF THE most common questions I get asked is: what should I eat, how much, and how often?

Less than a hundred years ago, there was no such thing as calorie counting. We need to get back to listening to our bodies and trusting our body's hunger and satiety cues. Many of us have become disconnected from these cues, but when we focus on more nutrient-dense foods and remove processed foods from our diets, we can start noticing our body's cues.

Intuitive Eating and Mindfulness

You need to dedicate time to sit down and eat in a relaxed state (required for proper digestion). You also need to pay attention to your hunger state. (Are you hungry or are you bored?) Being mindful of how you eat, how much you eat and why you eat is important. Practicing intuitive eating helps you to get there. Intuitive eating incorporates emotion and rational thought of eating. You define your hunger levels before you eat, while you eat, and after you finished eating. This helps those who are not in tune with their hunger cues.

Understandably, we've lost the ability to pay attention to our hunger cues. The food industry has done a great job of making foods that bypass the satiety hormones (remember, food companies find bliss points with salt, sugar and fat content). You can download an

intuitive eating and mindful eating guide sheet at www.carnivorecure.com/behavior.

Satiety Hormones

The body has several satiety hormones that tell us when to stop eating.

PeptideYY (PYY) is a peptide hormone that signals satiety, especially with proteins.

Cholecystokinin is a peptide hormone that signals satiety for fat.

Glucagon-like peptide-1 (GLP-1) enhances satiety and reduces energy intake.

Stretch receptors in the stomach signal to the brain that the stomach is stretching beyond capacity. Most vegetarians and individuals who eat a heavy fiber diet use this as their cue for fullness.

Incretins (gut hormones) can signal protein satiety.

Leptin controls appetite by signaling the brain to stop eating. Leptin regulates fat stores and energy intake so that the body's weight is in normal range. Leptin has also been found to play a role in autoimmune and inflammatory disease. Leptin activates the immune system and mediates inflammation.[319]

Gut damage can cause loss of satiety hormone signaling. Ghrelin (hunger hormone) and leptin are directly affected by changes in our gut microbiome. Healing the gut may support weight loss and improve hunger and fullness cues.[320]

Most of the satiety hormones are in the gut and are part of the digestive process. Healing the gut and removing processed foods that manipulate bliss point is key.

If you don’t eat enough and don’t get enough nutrients, your endocrine system is one of the first systems to suffer. You can survive today even if your thyroid isn’t working optimally. This is why, when someone is eating sufficient nutrient-dense meats (and properly breaking them down and absorbing the nutrients), the carnivore diet essentially begins to better regulate the endocrine system and all the hormones involved.

Macronutrient Amounts, Calories and Nutrient Calculators

We may try to fine-tune the number of hours we sleep and the macronutrient ratios in our meals, but some days we just wake up tired. We don’t need the same number of calories every day. This is where learning to eat intuitively is very important.

You may need to track when starting a carnivore diet, but only to get a sense of what amounts of proteins and fats you are consuming. You don’t want to under eat for long periods of time. But over time, let go of the calorie counters, macronutrient counters, and micronutrient counters.

You can do all the calculations you want, but lifestyle factors and nutrient absorption (gut health) will impact the ratios. Consume nutrient-dense whole foods (e.g., fatty fish, organ meat, eggs) and let your body figure out the proper balance for you.

If you’ve been undereating your whole life, you may initially need to gain weight to heal your basal metabolic rate and to properly absorb nutrients. If the body has been sustaining itself on few calories and even fewer micronutrients, there may be a period that the body will need to overeat and overly consume nutrients (supplement) to help the body get into a better nutrient balance. Once you heal the body,

absorb more of the micronutrients, and you are at a “normal” weight without counting calories, you can begin to use levers to get to your ideal weight.

Sometimes the weight our body wants to be at is not the weight we want to carry. You will have to figure out what levers you are willing to pull to get to the lower body fat percentage, and if it’s worth the tradeoff of a little less energy or a little more mood imbalance. The trade-off may be minimal and worth the lower setpoint of body fat percentage. Find out what tradeoff is worth it for you.

But first, heal the body.

Protein and Fat Minimums

We need to maintain lean body mass (muscle) for longevity. We need to eat adequate amounts of protein on a weekly basis. As a general rule of thumb, I recommend a minimum of 16 to 24 ounces (454 to 680 grams) of meat daily. These are estimates as some meats have more protein per ounce or gram. The general rule of protein should be at least 0.8 grams (0.4 kg) of protein per 1 pound of ideal or maintenance body weight. So if you weight 150 pounds (68 kg), you should consume at least 120 grams of protein. Ideal protein consumption is considered 1 gram of protein per 1 pound (0.5 kg) of body weight at maintenance. This would have you consuming 150 grams of protein daily. In Chapter 20, there are sample meal plans for a 150 pound person eating 1 gram per pound of maintenance weight, with varying amounts of fat consumption.

The need for fat consumption will vary by individual. Some people do better on a macronutrient profile of 70-80% fat and 20-30% protein. I have found that my female clients tend to do better on a higher fat carnivore diet. When women eat mostly lean proteins, their hormones often show imbalance. This will result in hair loss, loss of

period, and always feeling cold. Table 14.1 shares a variety of foods and their macronutrient profiles.

Remember, hormones are created by fat. For both men and women, the production of testosterone depends heavily on dietary fat intake. We need testosterone for muscle building, wound healing, recovery, feelings of well-being, and even libido.

For some people, too much protein can cause a dip in energy. It can be a deficiency in breaking down amino acids. Still, it can also be because the body needs to expend energy to convert excess protein into glycogen for storage (gluconeogenesis: body's process of converting protein into sugar). A way to test this is by checking your glucose levels before eating, one-hour after eating, and two hours after eating. The increase, especially without carbohydrates ideally, should be no higher than 20 points from glucose levels before eating.

DEMYSTIFYING FAT AND PROTEIN MACRONUTRIENTS

Sometimes macronutrient calculations can be confusing. Sometimes fat to protein is referred to as ratios (e.g., 2:1), as gram to gram comparisons or percentage of total calories (fat % vs protein %). There's also fat percentages for ground beef (75% lean, 25% fat). This tables brings all the semantics together. (USDA).

FOOD	CALORIES	FAT GRAMS	PROTEIN GRAMS	FAT CALORIES	PROTEIN CALORIES	% CALORIES BY FAT	% CALORIES BY PROTEIN	FAT:PROTEIN RATIO
Ground beef 75% lean / 25% fat, raw	293	25	15.8	225.5	67.3	77%	23%	3.5 to 1
Ground beef 80% lean / 20% fat, raw	254	20	17.7	180.4	73.3	71%	29%	2.4 to 1
Ground beef 90% lean / 10% fat, raw	176	10	20	90.2	85.4	51.4%	48.6%	1.1 to 1
Ground beef 75% lean / 25% fat, broiled	279	18.9	25.6	170.2	109.1	60.9%	39.1%	1.5 to 1
Ground beef 80% lean / 20% fat, broiled	270	17.8	25.8	160.4	110	59.3%	40.7%	1.5 to 1
Ground beef 90% lean / 10% fat, broiled	217	11.8	26.1	106	111.5	48.7%	51.3%	1 to 1
Ribeye bone-in, raw	260	21	18	189.1	76.5	71.2%	28.8%	2.5 to 1
Wild Atlantic salmon, raw	142	6.3	19.8	57.2	84.7	40.3%	59.7%	0.6 to 1
Farmed Atlantic salmon, raw	208	13.4	20	121	87.2	58.1%	41.9%	1.4 to 1
Chinook salmon (king salmon), raw	179	10.4	19.9	94.1	85.1	52.5%	47.5%	1.1 to 1
Pork belly, raw	518	53	9.3	478.2	39.9	92.3%	7.7%	12 to 1
Chicken thigh, raw	221	16.6	16.5	149.8	70.5	68%	32%	2.1 to 1
Chicken drumstick, raw	161	9.2	18.1	83	77.2	51.8%	48.2%	1.1 to 1
Egg, raw	143	9.5	12.6	85.8	53.6	61.5%	38.5%	1.5 to 1
Pork chop, raw	170	9	20.7	81.5	88.4	48%	52%	0.9 to 1
Canned sardines in olive oil, drained	208	11.5	24.6	103.3	105.1	49.5%	50.5%	1 to 1

Table 14.1. Demystifying Fat and Protein Macronutrients. USDA.

PROTEIN TOXICITY

Protein poisoning or protein toxicity is when you consume too much protein for the body's needs. While protein toxicity is not common, overconsuming protein does have adverse effects on the body. Here are some things to consider and be wary of.

DOES TOO MUCH PROTEIN MATTER?

- It is good to nourish the body with adequate amounts of protein and fat, but too much protein can overload the liver and kidneys.
- When kidney function is poor and the body isn't able to metabolize protein, buildup of protein metabolic waste (toxicity) can occur.
- Too much protein can also be a burden on individuals with liver issues. You need substrates to manage ammonia and nitrogen-based byproducts of protein metabolism.

SIGNS AND SYMPTOMS

- Low energy or fatigue
- High blood glucose ranges (>95 mg/dL)
- Ravenous hunger
- Fluid retention
- Excess foam in urine

RECOMMENDATIONS

- Trust the body and try eating intuitively.
- Protein needs are very bio-individual but try to eat around 0.8 g of protein per pound of ideal body weight to *no more* than 1.5g of protein per pound of ideal body weight. If you are very active, your body may be able to consume more protein.
- Protein requires a lot more water to be broken down so make sure to properly hydrate.
- Consider several meals of protein and fat to support digestion and the detox pathways for the liver and kidneys.

Table 14.2. Protein Toxicity.

If it does increase and you feel very tired, lower the protein amount (try having more meals) and increase the fat intake. You will have to

figure out what works best for you.

Glucose Levels

Carnivore dieters tend to have higher fasting glucose levels in the morning compared to dieters following a ketogenic or standard American diet (assuming no diabetes).

As we sleep, higher carbohydrate diets will require glycogen (glucose) through the night to keep fueling the brain. This depletes the glycogen stores in the liver and essentially why we may see lower glucose numbers in the morning for a higher carbohydrate diet. This also explains why we are hungry on a higher carbohydrate diet in the mornings—our glycogen stores are depleting and it's time to refill.

As we sleep, on a meat-based diet, our gluconeogenesis (converting protein to sugar) is running the same. Our brains are fueled with ketones, and hence why our blood sugar would be higher in the mornings—no glycogen depletions occurred overnight. As we use ketones, it is also why we are likely not hungry in the mornings.[321]

Hydration

Hydration is critical for optimal health. The general rule of thumb with water is to drink the number of ounces equal to half your body weight. So, if you weigh 150 pounds, you should drink about 75 ounces of water daily. If you drink a diuretic, including coffee or tea, you need to drink even more water (1.5 times the ounces of your diuretic drink). As an example, if you drink 12 ounces of coffee, you should drink at least 18 more ounces of water, making your daily total of water 93 ounces.

Table 14.3. Roles of Hydration in the Body.

For optimal digestion, don't drink anything 30 minutes before or after a meal. While eating, sip at most but don't gulp down liquids. The less you dilute your stomach acid, the better your body will digest and absorb food.

You can gauge hydration levels by considering your physical symptoms and checking the color of your urine. The ideal is faint yellow. Anything that looks like apple juice in the morning is considered dehydration.

While I generally say drink to thirst, I do recommend drinking at least 60 ounces of water in a day. Drink it with a little bit of mineral salt, for better absorption.

Our body comprises of 55 to 60 percent water, and water depends on electrolytes for proper absorption. Some of our daily physical symptoms may just be the body signaling that we need some water.

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319 Cojocaru et al., “Role of Leptin in Autoimmune Diseases,” 68–74.
320 Yanagi et al., “Changes in the Gut Microbiota … Therapy.”
321 Layman et al., “Increased Dietary Protein … Loss,” 405–10.

Chapter 15

Carnivore Cure Weekly Protocol

Have patience. All things are difficult before they become easy.

—Saadi

ONCE YOU PREPARE your mind and your home, you are ready to start Carnivore Cure. If you don't suffer from any food sensitivities or gut health issues, you can essentially bypass the early weeks and eat all the meats.

Keep a food and mood journal when you first start an elimination diet, which includes the types of foods eaten and how they make you feel. This will help you become aware of mind and body connections with specific foods. You may notice that specific foods make you tired. The more you journal these details, the better you can identify your food sensitivities. In the Carnivore Cure program, you will work through this process. You can also download my food and mood journal template at www.carnivorecure.com/nutrition.

One word of caution: If you've had any vaccines in the last six months to a year, you may want to stay away from eggs—especially egg whites—because they are a known allergen in vaccines.

Week 1

No poultry, pork, or fish during the first week. Ruminant meat (beef, lamb, bison) is better tolerated for individuals with food sensitivities. You may want to start with grass-fed, pasture-raised meats to have the cleanest baseline, but it's optional (except poultry).

Do not buy packaged ground meat unless the butcher grinds it in front of you.

1. Beef
2. Lamb
3. Venison
4. Bison
5. Elk
6. Organ meat of only animals listed
7. Water
8. Black Coffee (Optional). Those with adrenal imbalance, mold sensitivities, histamine intolerance, and severe gut dysbiosis should eliminate coffee for now.
9. Seasonings: Salt. No other plant seasonings plant reintroductions.

Cooking Methods

Strictly speaking, boiled meats are the safest option as boiling reduces cyclic amines (toxins from cooked meats) and makes meat more digestible. Not everyone needs to do this, but if you have severe gut issues, boiling may be the best option.

The next best option is to use the sous vide method (not in a plastic bag) or lightly cook for shorter periods.

Other Notes (for people with severe gut dysbiosis)

If you still have bloat, stomach pain, and loose stools (and not because of the transition to an animal-based diet), avoid meats high in glycosaminoglycans (the carbohydrates in meats), which means meat that has cartilage, ligaments, and joints. Remove the lining

between the meat and fat on a New York strip. Stay away from bone broth. Glycosaminoglycans can disrupt the work of healing the gut.

Avoid meats that are high in histamines: Eliminate bone broth, ground beef, deli meats, and aged meats.

Don't eat fermented or prebiotic foods. No apple cider vinegar in broths or for digestion, because it can feed opportunistic yeasts and fungus in the body.

Support

Supplement with my Gut Healing Kit or find supplements that have similar nutrients (hydrochloric acid, digestive enzymes, protease for protein digestion, lipase for fat digestion, inflammation-reducing support, and spore probiotics). You can learn more at www.carnivorecure.com/resources

If you have severe gut health issues, I don't recommend taking all these supplements at once—it might be too much for your body.

Preparing for Week 2

Note any foods that made your body unhappy. Try to identify the food so you can be confident it is the culprit. Once you have done that, eliminate that food from your diet for now.

The goal is to have at least three symptom-free days so that you can add other foods. You can stay with the week one protocol for longer than seven days, depending on your body's needs.

If you have an adverse reaction, wait until the reaction passes before trying other foods from week 1. Repeat this process for every new food. Keep a food and mood journal. Tracking is critical.

Week 2

During week 2, you may eat all the foods permitted during week 1 and add the following:

Permitted Foods

1. Organic Turkey (initially, poultry should be organic)
2. The yolks of eggs from organic, pasture-raised poultry (chicken and ducks). No egg whites.
3. Ghee made from grass-fed cows, but no butter. If you cannot tolerate dairy, you probably should not add ghee this soon. The process of making ghee—clarifying butter—removes most lactose, but ghee is still a dairy product.
4. Animal fats from beef and poultry, but no lard, tallow, or rendered fats. Permissible fats include suet and fat connected to meats.

Cooking Methods

Same as week 1.

Other Notes (for severe gut dysbiosis)

Same as week 1.

Support

Same as week 1.

Preparing for Week 3

Same as week 1.

Week 3

During the first half of the week, try eating only pasture-raised pork and try different cuts: pork belly, ribs, and bacon. Be wary of anything added to the bacon: omit bacon with MSG, sugars, or

nitrates/nitrites. By the latter half of the week, try seafood. Wild-caught seafood is best because farm-raised fish can have allergens from cross-breeding. Do not eat shellfish because they are higher in histamines and allergens.

Cooking Methods

Same as week 1. The best options for preparing fish are roasting, baking, and grilling. Use ghee to keep them from sticking to the pan or grill.

Other Notes (for severe gut dysbiosis)

Same as week 1.

Support

Same as week 1.

Preparing for Week 4

Same as week 1.

Week 4

You may add organic, pasture-raised chicken to your diet, but chickens are high in lectins (antinutrients) and moderate in histamines. Most conventional chickens grown in the United States have been fed antibiotics. If you incorporate chicken in your diet, make sure to buy the highest quality, perhaps from a local organic farmer. You can try conventional chicken (nonorganic) as your body (and gut) becomes stronger.

Cooking Methods

Once you have established which animal-based foods you can eat without experiencing symptoms, you can try different cooking methods to see if a particular method adversely affects you. Some

people don’t do well with slow-cooked meats because slow cooking can release histamines that cause bloat. First figure out the type of meats you can eat, then see if a cooking style affects you adversely.

Other Notes (for severe gut dysbiosis)

Same as week 1.

Support

Same as week 1.

Preparing for Week 5

Same as week 1.

Week 5 and Beyond

I recommend introducing week 5’s foods one at a time and for a few days at a time. What you want to find out this week is whether you can now be symptom-free when you eat foods that you previously could not. Take notes on whether you experience less inflammation overall, almost no digestive issues, minimal to no physical symptoms, and fewer allergies and skin conditions.

Remember, eat your baseline foods and add one new food at a time, for a minimum of three days. That means that if you choose to reintroduce each of the following ten foods, it will take you a month to work through this list (assuming no food sensitivities):

1. Grass-fed ground beef or pasture-raised chicken
2. Organic, pasture-raised eggs from chicken, duck, and quail (soy and grain-free is best)
3. Grass-fed butter (this should determine your ability to tolerate dairy). Raw butter is ideal.

4. Raw cheese from the milk of organic, grass-fed cows and goats or lactose-free cheeses
5. Wild-caught shellfish

The following foods aren't ideal to consume daily, but can be incorporated to have variety on a carnivore diet. It will likely take time to incorporate these items. Try to find the highest quality sourcing for these:

1. Cured meats (limit consumption but see if you can tolerate)
2. Wild canned fish (limit consumption because of toxins in canned foods)
3. Organic deli meats and sausages
4. Organic store-bought jerkies
5. Pork rinds (look for some cooked in lard or baked with no added sugars, MSG, or seasonings)

Cooking Methods

Same as week 1.

Other Notes (for severe gut dysbiosis)

Same as week 1.

Support

Same as week 1.

As your symptoms disappear or become minimal, you should be able to cut down on supplements over time.

Moving Ahead

Once you establish what you can eat, and any adverse symptoms remain nonexistent or minimal for at least one hundred days, you are

ready to try the reintroduction of animal-based foods. These foods were the animal-based foods that you could not tolerate when first starting Carnivore Cure.

The reintroduction of these animal-based foods will tell you whether you are ready to try plant-based foods. If you can tolerate more animal-based foods, you are closer to reintroducing the least toxic plant-based foods.

Chapter 16

Detoxification

The darkest hour is just before the dawn

— Victor Hugo

THE BODY'S DETOXIFICATION process is complex. It requires the detoxification organs to be healthy and capable of performing detoxification duties. The kidneys and liver support the detoxification process, but if they are burdened or overtaxed, it may be better to hold off on detoxing. If you struggle with blood sugar dysregulation, poor kidney function, fatty liver disease, and other conditions, I recommend waiting to detox the body simply because you cannot expect a sick body to detox.

Once you started Carnivore Cure and you notice that your health markedly improves—you essentially feel better with each passing day, your body may be ready to do some heavier detoxing.

Going About It the Right Way

Proper detoxification requires working closely with a medical practitioner. Detox supports can be powerful and even harmful if incorrectly used. I have a detox support handout. If your trusted practitioner is not familiar with most of these supports—whether they agree or not—I'd consult someone else. It's your health. Find the best that can support you. You can download the detox support handout at www.carnivorecure.com/resources.

To properly detox, the body needs to be in a rested and relaxed (parasympathetic) state. This is why a lot of detoxification happens

while you are sleeping. Detoxification frees vital activities in the body to function effectively. The body naturally detoxifies—this is the natural way the body cleans, heals, and repairs itself.

The body has two phases for detoxifying. During the first phase, detoxification enzymes in the liver break down molecules. This takes care of most toxins, but some require further detoxification so that toxins are neutralized before being eliminated.

Phase 2 has multiple channels to support the breakdown of toxins that survived through phase 1. These toxins are bound to designated proteins and then escorted from the body through the bile or the kidneys.

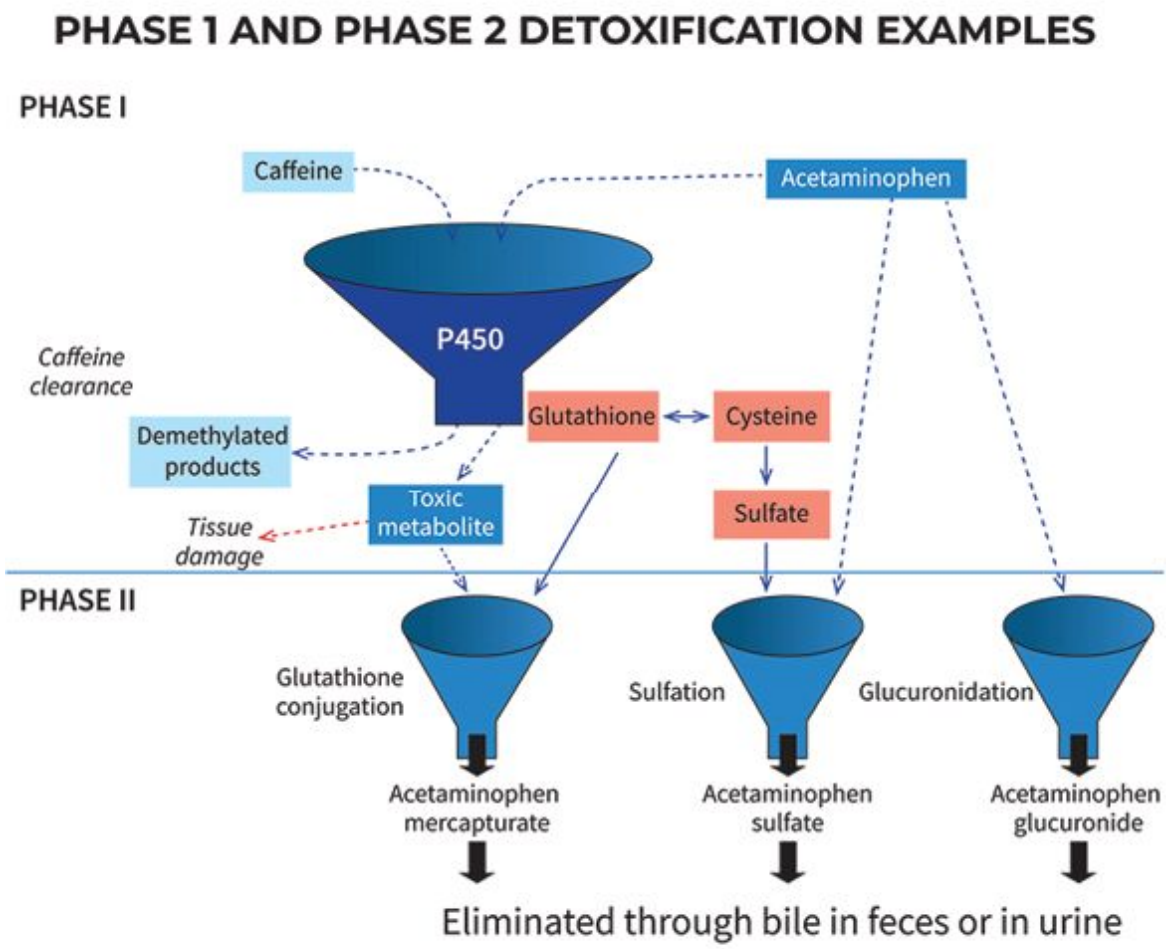
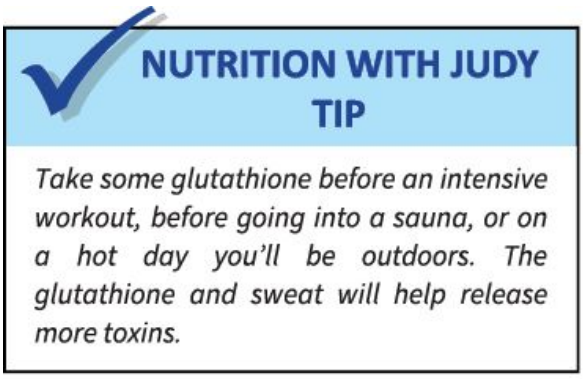
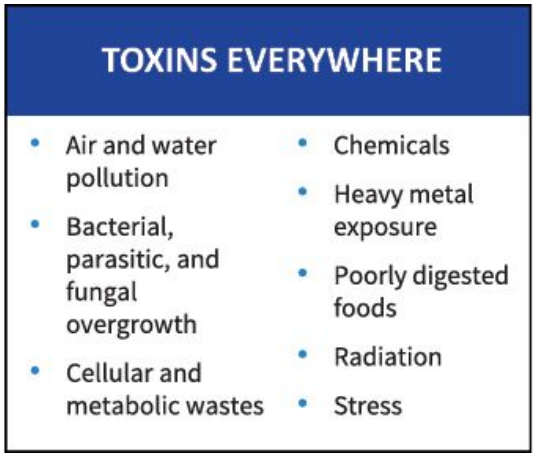


Figure 16.1. Phase 1 and Phase 2 Detoxification Example.

All the organs in the body need blood. Blood shuttles oxygen and nutrients to where they are needed. The blood supports detoxification as the main access road for the immune system. The lymphatic system uses lymph nodes to filter out toxins. Lymph flows through the system at the rate of three liters a day while blood flows at a rate of five liters per minute. The lymphatic system has no pump to support circulation (whereas blood has the heart). Nearby skeletal muscles enable the movement of lymph, which is why exercise is so important.

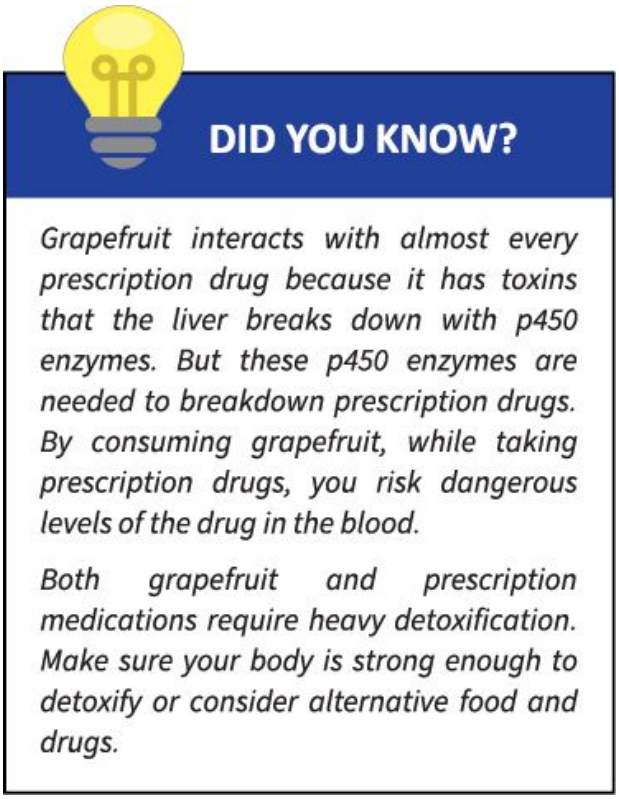




Firmly brushing the skin with a dry brush, jumping rope, doing jumping jacks, and rebounding are great activities for stimulating the lymphatic system. Proper hydration keeps the blood at the right level of fluidity and delivers toxins to the lymph system and liver for removal.

Toxins are flushed from the lungs (breath), from the kidneys (urine), from the digestive tract (feces), and the skin (sweat).

This is why fasting, sweating (whether during exercise or in a sauna), herbs, water, rest, meditation, exercise, enemas, and movement all support detoxification.



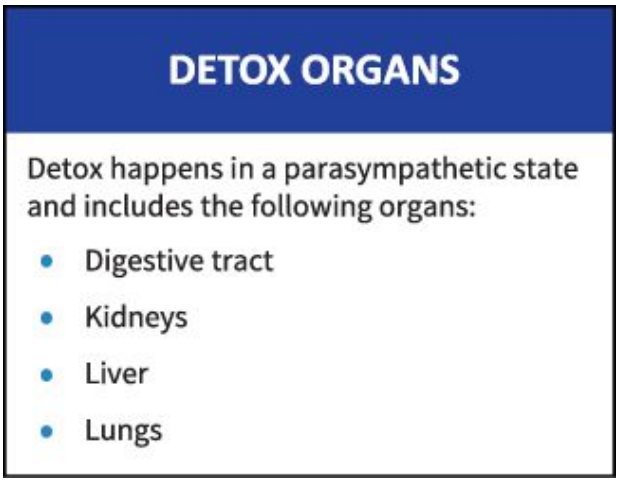
If you have compromised gut health, toxic foods can break down the body's detoxification pathways. For the liver to detoxify properly, your body needs to break down foods so that you can absorb nutrients as specific amino acids support the liver's detox pathways. Poor fat digestion not only causes loose stools, but it also clogs the lymphatic system—and when that system can't do its job, the liver becomes congested.

Phase 1 detoxification enzymes need vitamin B2. People on a low-carbohydrate diet seem to need more B2 than standard American dieters for fatty acid oxidation. Yes, eating fatty fish can help the body to detoxify.

Green juice detoxification protocols are less than ideal because they deplete the body of nutrients and calories and are high in sugar (the excess sugar stimulates cortisol, which depletes B vitamins). This will tax the liver and starve the body of energy. How can the liver detoxify, when its "fuel" is full of antinutrients, sugar, and toxins?

Green juice detoxification is nonsense because the body will concentrate on purging itself of the green juices.

So why does your body feel more energetic during a green juice detox? Because depleted of nutrients and sugar, the body is pumping out cortisol and other stress hormones to tell you to go find food before you die. Trust me: it's not the green juice.[322]



If your gut is functioning properly, bile built of healthy fats supports the removal of toxins through the intestinal tract. Toxins can also deplete the body of magnesium, which can lead to deficiencies in the detox enzymes the body needs for phase 1 liver detoxification.

FOODS HIGH IN VITAMIN B_2 (RIBOFLAVIN)

The following foods are good sources of vitamin B_2. Vitamin B_2 can act like an antioxidant nutrient and prevent free radical damage. Vitamin B_2 aids in energy production, supports mineral absorption, helps regulate thyroid activity in the body, and strengthens the immune and digestive system. (USDA)

FOOD	AMOUNT PER 100 G	
Pork liver, raw	• 3.0 mg	
Beef liver, raw	• 2.8 mg	
Chicken liver, raw	• 2.3 mg	
Salmon roe, raw	• 0.8 mg	
Beef skirt steak, raw	• 0.7 mg	
Salmon, wild, raw	• 0.5 mg	
Eggs, raw	• 0.5 mg	
Turkey, dark, raw	• 0.6 mg	
Pork shoulder, raw	• 0.5 mg	
Chicken, dark, raw	• 0.3 mg	

Table 16.2. Foods High in Vitamin B2 (Riboflavin).

Many cofactors contribute to detoxification. Magnesium is critical to the natural self-cleansing and detoxification process of the body. Zinc helps to displace heavy metals in the body. Molybdenum and manganese activate metabolic and detox enzymes, and other minerals help to balance heavy metals from collecting in tissues. Chelating agents bind to heavy metals in the body for removal. Detoxification requires a healthy body that is nourished with nutrient-dense foods and gets quality sleep. Do not simply supplement when you aren't sure what is needed. Work with a trusted practitioner.

Table 16.3. Detox Supplemental Therapies.

There are a handful of FDA-approved chelators. One is dimercaptosuccinic acid (DMSA). DMSA, sometimes referred to as captomer, chemet, or succinic acid, has been marked safe to remove lead and mercury from the body. DMSA is said to remove twenty-two other toxic heavy metals from the body without removing any beneficial minerals as it chelates to only foreign substances in the body. It sounds a bit too good to be true. But if you have severe lead and mercury toxicity, I'd do some more research.[323]

One popular chelating agent is chlorella, and one study showed that mercury was lowered due to the presence of chlorella.[324] Well, chlorella only works as a possible chelating agent when it's alive. Yes, chlorella is dead in its supplement form. You are essentially eating dead algae that has no chelating effects—snake oil at its finest.

At the core, we need the detoxification pathways to be strong to detoxify. Table 16.3 shows ways to support detoxification in the body.

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322 Ani and Abel, “Nutrient, Phytochemical, and … Extract,” 653–58.
323 Wax, Paul M., “Current Use of Chelation in American Health Care.”
324 Merino, José Joaquín, et al. “The Long-Term Algae Extract (Chlorella and Fucus sp) and Aminosulphurate Supplementation Modulate SOD-1 Activity and Decrease Heavy Metals Levels in Patients with Long-Term Dental Titanium Implants and Amalgam Fillings Restorations.”

Chapter 17

Carnivore Cure Plant Reintroduction

The only person you are destined to become is the person you decide to be.

— Ralph Waldo Emerson

REINTRODUCING FOODS IS a tricky process, as reactions may not show up immediately. That is why most reintroduction protocols recommend reintroducing one food at a time every few days. With plant-based foods, in particular, I highly recommend taking a full week to reintroduce each new food (even though three days is the normal standard). Remember your baseline of health (few physical symptoms) before reintroducing plant-based foods—you'll want to keep as close to that baseline, even after adding plants to your diet.

One plant food for one week at a time is a prolonged process. But it's the surest way to eliminate the food-culprit guesswork. You will eventually put together a perfect food list that's made just for you.

By healing your gut and getting back to optimal health, you should be able to handle less-than-ideal foods, albeit less often than you'd like (vacations).

For every new plant-based food reintroduced, the goal is to identify any food intolerances and sensitivities by paying attention to how your body reacts after you eat them. You can download the food and mood journal as an aid at www.carnivorecure.com/nutrition.

Here are some tips for reintroducing edible plants:

- *Start slow.* Take it slow and start with one food at a time. Start with half a serving of boiled bok choy, for example.
- *Source the best quality.* The ideal is to consume fruits and vegetables from your garden. If you can't do that, try to find fresh fruits and vegetables from a local farmers' market or sources you trust. Otherwise, organic is the next best option.
- *Cook your plants.* Try not to eat plants raw. Make sure to cook, boil, or steam the plant. Throw out the water because it contains antinutrients. See Chapter 7 for information about properly preparing, soaking, and sprouting plants for consumption.
- *Limit fruits.* If you eat fruit, make sure to wash the skin well or remove it. Never eat the seeds or pit. Limit your daily fruit consumption; it is nature's candy.
- *Remove foods with high antinutrients.* Limit foods high in antinutrients. This includes plant foods that are high in lectins (squash, potatoes, grains), high in oxalates (almonds, dark chocolate, turmeric), high in phytates (nuts and grains) and high in FODMAPs (beans and legumes). They do so much harm to the body that they are not worth eating.
- *Document your journey.* If you have a noticeable immune response or a particular food causes inflammation (joint pain; rashes, acne, or hives; and aches) or any other reaction or symptom), then the food is probably the culprit. Keep a journal and document as much as possible.
- *Always go back to your baseline foods.* Remember, return to eating only your safe foods before trying to reintroduce

another one. Wait until you are symptom-free before you try another new food.

- Many people never will do well with gluten and other foods high in antinutrients. Many people don't do well with dairy. Take the time to figure out what works best for you.
- *Be patient.* Spend a year to figuring out which foods are best for you and then you may never have to worry about food sensitivities again. The other option is to struggle throughout your life, trying to figure out what's causing you issues—occasionally using partial elimination diets and food sensitivity tests.

You can also forgo this entire reintroduction process and stick to the foods you know don't cause problems (meat).

Food Sensitivity Testing

While you are reintroducing foods, you can also perform the Coca pulse test. When your body experiences stress, it will respond with an increased pulse rate. The stress can be physical or emotional and often is a response to exposure to potential allergens. Dr. Arthur Coca, an immunologist, found the connection between the exposure to allergens and the increased pulse rate. Here's how to perform the test:

1. Be in a calm, relaxed state.
2. Take the test on an empty stomach—at least two hours without food.
3. Take your pulse for a full minute. (Counting each pulse for 60 seconds is the most accurate method.) This is your baseline pulse rate.

4. Take a bite of the suspect food. Chew it slowly. Taste it on your tongue for thirty seconds. Do not swallow. Keep in it your mouth.
5. With the food still in your mouth, take your pulse for another full minute.
6. If your pulse increases by six points or more, you probably are having a stressful reaction to the food you are testing. You probably have a sensitivity to that food.
7. Spit out the food. Rinse your mouth, and wait at least two minutes for your pulse to return to your baseline.
8. Repeat all the steps with other foods.[325]

Read Labels

Ideally, the foods you are eating have no ingredients to list. Or, if it does, it has only one or two items. The rule of thumb is: if you don't recognize the ingredient, your body probably does not either.

Read the carbohydrate count, not just the grams of sugar. All carbohydrates essentially become sugar in the body. Many foods that have fewer than 0.5 grams of carbohydrates can be labeled as having zero. As an example, heavy whipping cream has some amount of carbohydrates per serving, but dairy companies can list the carbohydrates in the cream as zero. Several servings of heavy cream can become a few grams of carbohydrates. Shredded cheese and foods that contain trans fats also use these tactics. How can shredded cheese, which often contains potato starch, have no carbohydrates?

Be Wary of Marketing Tactics

The food industry spends billions of dollars determining the best marketing tactics for selling more of its foods to consumers. The

following are some examples of wording you'll find on packages that probably doesn't mean what you think it does:

Fortified or enriched—This means that nutrients have been added back to the food. The vitamins in all pasteurized milk have been added back to milk. Vitamin D is a fat-soluble vitamin, which means it needs fat to be absorbed. How does vitamin D in fat-free milk get absorbed?

Fruit-flavored—These foods rarely have fruit. Instead, they contain chemicals that taste like fruit.

Gluten-free— Gluten-free junk is still junk. Many gluten-free products are highly processed and use inflammatory vegetable oils and sugars. Some products never contained gluten in the first place—like fresh oranges in a bin with a sign that markets them to be gluten-free.

Light (or lite), low-fat, low-calorie—These terms refer to reduced calories or reduced-fat but usually mean more sugar. Remember, fats are more calorically dense (per gram) than carbohydrates. If you swap a gram of fat for a gram of sugar, you now have a lower calorie and lower fat option.

Low-carbohydrate—Every food manufacturing company is jumping on the low-carbohydrate wagon. Checking the nutrients and ingredients label is a must. A common trend is low-carbohydrate snacks that use maltitol and other processed sweeteners and inflammatory oils. Maltitol will raise your glucose levels higher than table sugar. You might as well consume real sugar. Bring out your glucose monitor and do some testing.

Cauliflower pizza is another misleading product. Cauliflower pizza does not always mean lower carbohydrates. Many cauliflower pizzas in the frozen section are high in carbohydrates because

they use rice flour and tapioca starch. Check the label and at restaurants, ask for the ingredient list.

Multigrain—This labeling means that the product has more than one grain, but most of the grains are refined. If the label says "made with whole grains," whole grains probably constitute a minuscule part. If the term is not at the top of the ingredients list, don't buy the product. (We should not be consuming *any* grains for optimal health).

Natural—As I've said, all this means is that this product, at one point, used a natural source. Well, according to the FDA, high-fructose corn syrup is natural.[326]

Organic—As I have discussed (see Chapter 6), this labeling is no longer monitored by the FDA. Also, *organic* doesn't mean it's optimal food. Organic sugar is still sugar.

Sugar-free/no added sugar—These products are usually naturally high in sugar (apple juice, raisins) and may also use artificial or natural sweeteners. These are not good for gut health and also fuel food addictions. Many of these sugars and sweeteners cause a spike in insulin.

Zero trans-fat—Some fats turn to trans-fat after processing. These fats don't have to be labeled as trans fats. Remember, all foods can be listed as zero, as long as the food contains fewer than 0.5 grams of them in one serving.[327]

The Carnivore Cure Plant List

This Carnivore Cure plant list is based on peer-reviewed research, studies of autoimmune disease, studies of antinutrients, and comparison data for other well-regarded elimination diets.

The plant list has about 500 plant-based foods. You can find the full list at www.carnivorecure.com/protocol.

I know you are waiting for an elusive, magical list, but frankly, the list will somewhat vary according to your metabolic flexibility and the state of your gut health. I am sharing my top ten list that most people can tolerate with better gut health. The full plant database will be more helpful for your specific needs.

Remember, every single plant-based food has antinutrients. We don't eat plant-based foods for nutrition but for variety. The goal of the Carnivore Cure reintroduction is that you find the plant-based foods that your body can tolerate.

Top Ten

If you were to reintroduce any plants, Figure 17.1 on the next page contains what I'd start with:

PLANT FOOD REINTRODUCTIONS

After cross-referencing multiple elimination diets and removing plants with the most toxic antinutrients, these vegetables are the safest plants to begin the Carnivore Cure reintroduction protocol.

Remember, all plants have antinutrients, so start slow. Initially prepare plants by boiling and then try steaming. This will remove some of the antinutrients and make them easier to digest.

These plant foods have:

- No—low in histamines
- Very low—low in oxalates
- Low—moderate in salicylates
- No—low in phytates
- No—low in lectins
- Low—moderate in glucosinolates
- Permitted on AIP and FODMAP diets

FOOD		CAUTION
• Arugula		• Low-mod glucosinolates • Moderate in salicylates
• Boy choy		• Moderate glucosinolates • Possible salicylates
• Broccoli		• High glucosinolates • Moderate salicylates
• Cabbage, green		• Low-mod glucosinolates
• Cabbage, red		
• Chives		
• Kale, purple		
• Kohlrabi		• Mod-high glucosinolates
• Lettuce, iceberg		
• Rutabaga		• Moderate glucosinolates

Figure 17.1. Safest Plant Food Reintroductions.

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325 Coca, *The Pulse Test.*

326 Laura Crowley, "HFCS Is Natural, Says FDA in a Letter," *Foodnavigator-Usa.Com*, 2008, https://www.foodnavigator-usa.com/Article/2008/07/08/HFCS-is-natural-says-FDA-in-a-letter.

327 U.S. Food & Drugs Administration, “Small Entity Compliance Guide: Trans Fatty Acids in Nutrition Labeling, Nutrient Content Claims, and Health Claims.” U.S. FDA, 2003. https://www.fda.gov/regulatory-information/search-fda-guidance-documents/small-entity-compliance-guide-trans-fatty-acids-nutrition-labeling-nutrient-content-claims-and; https://www.federalregister.gov/documents/2003/08/20/03-21228/small-entity-compliance-guide-on-labeling-trans

Chapter 18

Holistic Lifestyle Changes

Very little is needed to make a happy life; it is all within yourself, in your way of thinking.

— Marcus Aurelius

I'D BE REMISS if I did not include lifestyle changes as part of the Carnivore Cure protocol. If there was a holistic health priority list, I'd say nutrition is most important. But close behind are sleep and stress management. With chronic poor sleep and chronic stress, your health will be compromised. You can see my hierarchy of optimal health in Figure 18.1. For humans to thrive, all the basic needs and psychological needs must be met.

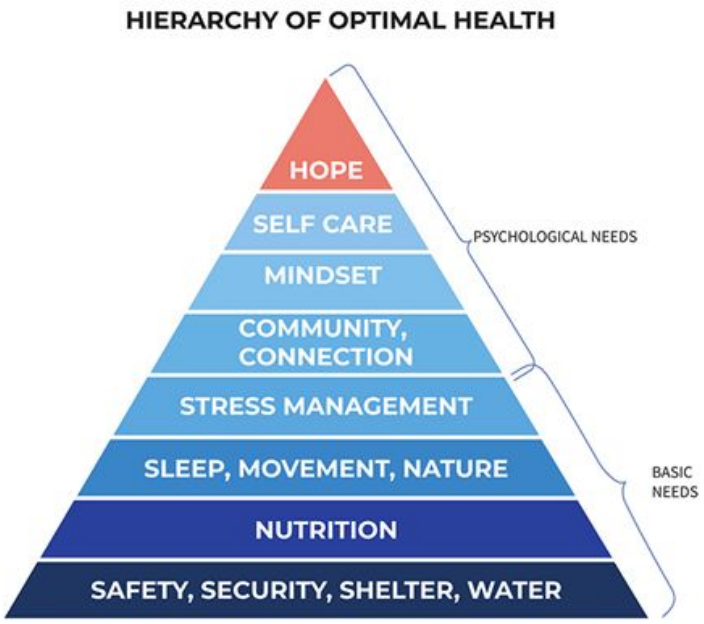
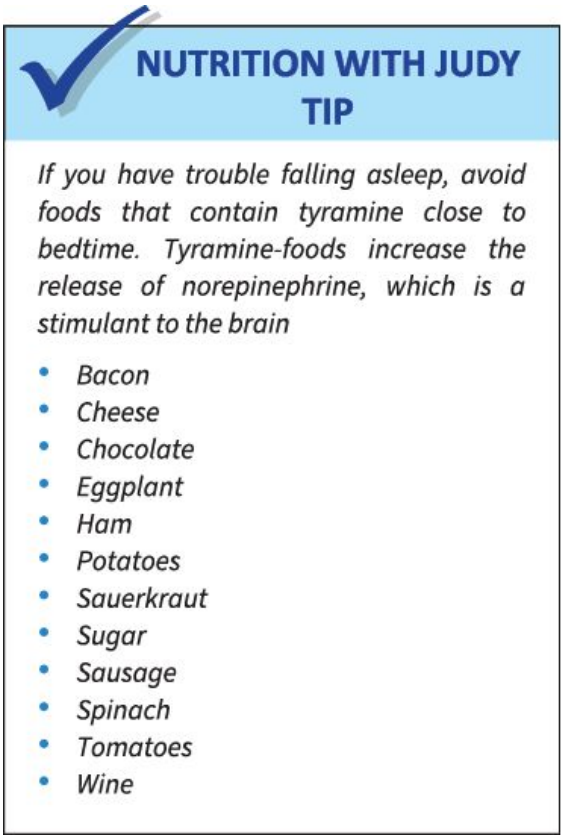


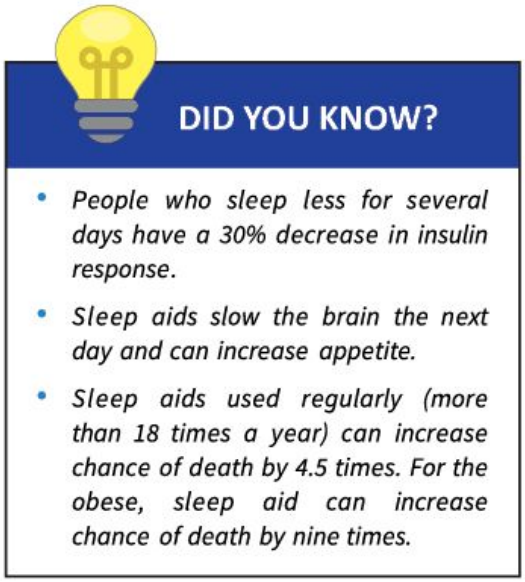
Figure 18.1. Nutrition with Judy's Hierarchy of Optimal Health.

Sleep

Sleep is critical for optimal health. According to the American Sleep Association, 50 to 70 million U.S. adults struggled with a sleep disorder in the early 2000s. This number is still considered representative in 2020. Given the increasing use of technology, electromagnetic field (EMF) exposure and social media usage, the number of Americans struggling with sleep disorders is much higher now. If you add in the epidemic of diabetes and chronic stress, which both cause hypoglycemic episodes at night (causing the person to wake up), most Americans suffer from sleep disorders.

But sleep aids and melatonin supplements are not the answer. When we use sleep aids, they knock us out cold, but they do not support us to get restorative sleep. This is why people who take sleep aids do not feel well-rested, even after eight hours of sleep. Melatonin is a hormone and should be produced by the body's natural circadian rhythm. When we use supplements, we are weakening the body's ability to find homeostasis.





Lack of sleep affects our hormones and causes the body to age quickly. The brain needs sleep before and after learning to properly save and store memories, as well as any new learning. Think of the brain as containing file cabinets. The body needs sleep beforehand to ensure there is room in the file cabinets to properly store information after learning. The brain can't absorb as much when we don't sleep, and the brain can't save as much of our learning into memory. I recommend reading what Matt Walker, the sleep scientist, has written about sleep spindles. His research shows that without sleep, your ability to learn decreases by 40 percent in just one night.[328]

SLEEP DISORDER STATISTICS

50 to 70 million	• U.S. adults that have a sleep disorder
48%	• Of the 50 to 70 million, reported snoring
37.9%	• Report unintentionally falling asleep during the day at least once in the preceding month
4.7%	• Report nodding off or falling asleep while driving at least once in the preceding month
1,560	• U.S. annual fatalities due to sleep disorders
40,000	• U.S. nonfatal injuries annually due to sleep disorders
30%	• Adults reported short term issues of insomnia (most common sleep disorder).
10%	• U.S. adults struggle with chronic insomnia
25 million	• U.S. adults have obstructive sleep apnea
9 to 21%	• U.S. women have obstructive sleep apnea
24 to 31%	• U.S. men have obstructive sleep apnea

COMMON SLEEP WAKE DISORDERS

- Breathing-related sleep disorder
- Circadian rhythm sleep-wake disorders
- Hyper-somnolence disorder
- Insomnia disorder
- Narcolepsy
- Nightmare disorder
- Non-REM sleep arousal disorders
- REM sleep behavior disorder
- Restless leg syndrome
- Substance/medication induced sleep disorder

Table 18.2. ASA, "Sleep Disorder Statistics."

What's concerning is that students are more sleep-deprived than ever in history. Twenty percent of teenagers get fewer than five hours of sleep and the average teen sleeps only six to six-and-a-half

hours. They are not only negatively affecting their overall health and growth but risking their ability to learn and retain information. They are also putting themselves at risk for mental health problems.[329]

Walker's work shows a correlation between older people and poor sleep and subsequent memory problems. Recent studies confirm the relationship, and that sleep even impacts Alzheimer's. What if the older population is waking up not because of aging, but because of blood sugar and endocrine imbalances? Would this help support the "worsening of learning and memory" in the older population? In 2015, in the United States, 12 million seniors had diabetes.[330]

Sleep also affects the cardiovascular system. Walker notes that heart attacks increase by 24 percent the day after daylight saving time starts in March—when we lose an hour—and the number of heart attacks decreases by 21 percent the day after daylight saving time ends in November. Studies confirm that sleep affects the cardiovascular system.[331] Other studies show that sleeping fewer than six hours a night increases the risk of heart disease.

Sugar negatively affects the immune system. Well, sleep does, too. Studies show that poor sleep decreases the release of some of the most potent immune cells—the natural killer cells. Sleeping four hours reduced the natural killer cells by a whopping 70 percent; such little sleep causes immune deficiency and an increased risk of bowel, prostate, and breast cancer.[332]

The International Agency for Research on Cancer now classifies any job with nighttime shift work as a probable carcinogen because it disrupts the natural sleep rhythm.[333] Remember, sugar and carbohydrates deliver short, emergency bursts of energy. So when a nighttime shift worker is sleep-deprived, they often turn to sugary foods for energy. Lack of sleep has been shown to increase blood

sugar levels and increase the risk of diabetes. And when our body is sleep-deprived, we are far more irritable and susceptible to stress. When stress comes into play, the adrenals communicate with the pancreas and eventually cause insatiable sugar cravings for energy.

Because the body survives on and regulates blood sugar with insulin and the adrenal-emergency cortisol release, we wake up in the middle of the night. We have hypoglycemic responses in the middle of the night because our blood sugar gets too low, and the adrenals swoop in and save us by releasing cortisol. But the burst of cortisol to raise our blood sugars wakes us up, further disrupting our sleep. Many studies show that people who sleep fewer than six hours a night are more likely to have blood sugar problems than those who sleep more.[334] Figure 18.3 depicts the metabolic consequences of sleep deprivation, including increased inflammation, increased insulin resistance and increase diabetic risks.

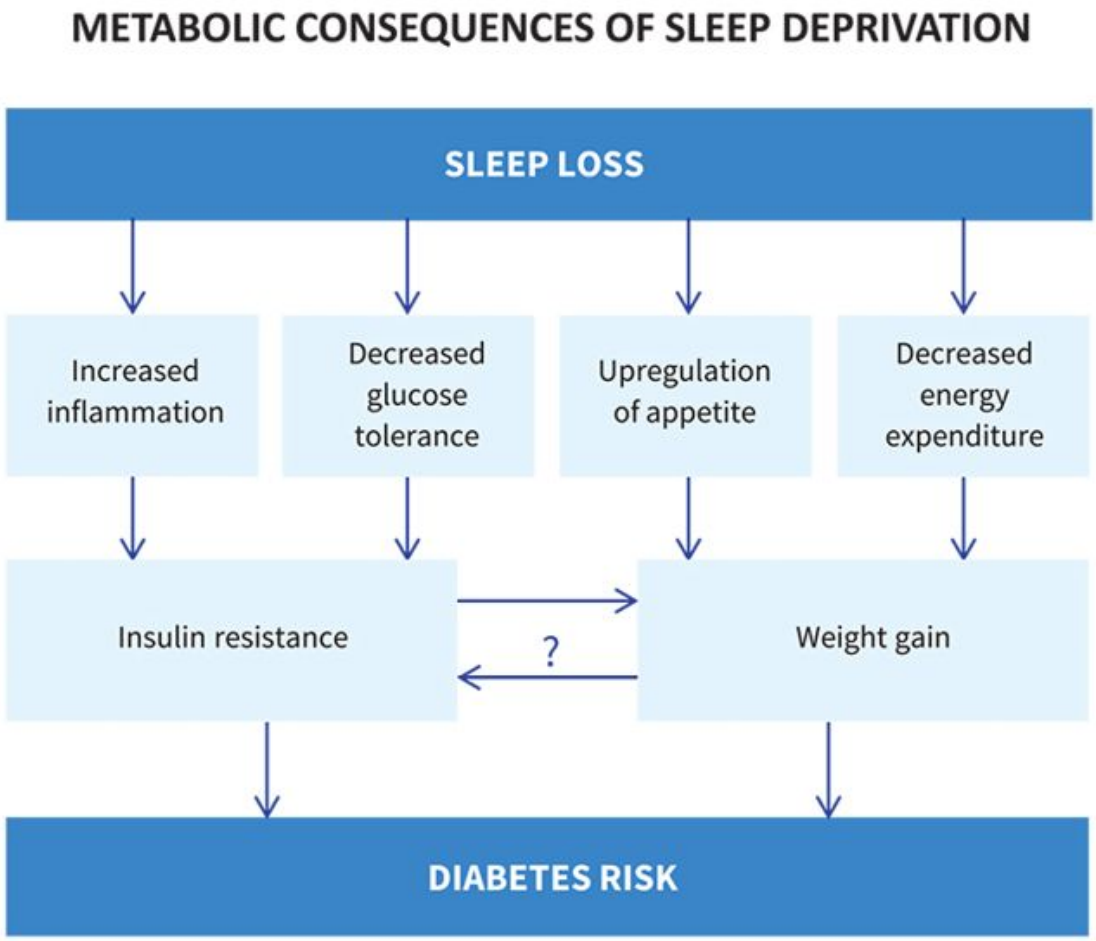


Figure 18.3. Ip, Mary, "Sleep and Glucose Intolerance/Diabetes Mellitus," *Sleep Med Clin*, 2(10): (2007): 19 -29.

We need sleep. Every single part of our body needs sleep for optimal health. Not everyone can sleep through the night. While diet won't change sleep habits, diet can help us sleep through the night. Sleeping sixty to ninety minutes more per night can make you feel happier and healthier.[335]

Hormesis

The simple explanation of *hormesis* is a beneficial effect at small doses of a substance but harmful biological effects at larger doses. Too little is good, but too much is bad—Goldilocks (and the three bears) matters here. Figure 18.4 shows the hormetic region when

the amount is beneficial and the hormetic amount when the amount is toxic.

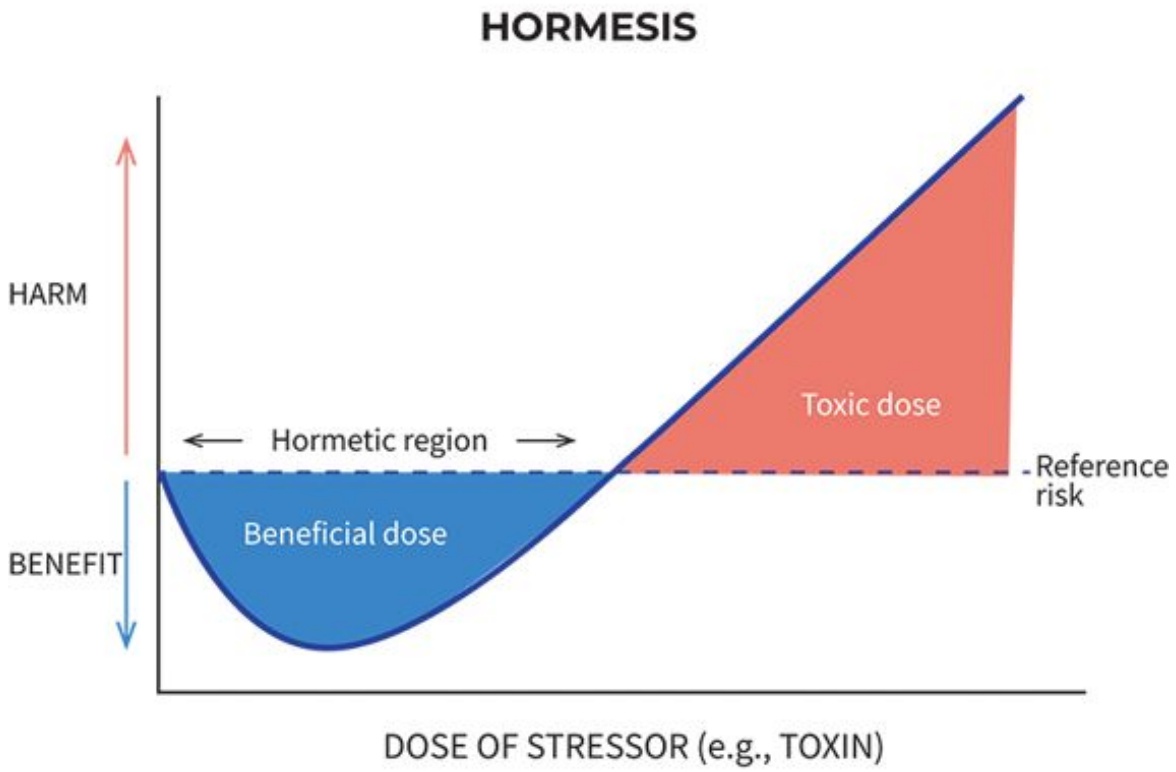


Figure 18.4. Hormesis.

The most common form of hormesis or hormetic stress is exercise. Exercise may initially put stress on the body, but the exercise stress then expands muscle capacity and improves our overall health. When you exercise, you produce more cell energy. The body is able to cope with and exceed the burden of the exercise, so the net result is a positive outcome.

When you lift weights, you don't build muscles immediately. Lifting weights weakens the body and releases free radicals that can injure the body's cells. The body responds by producing antioxidants and initiating DNA repair. Thus, the hormetic stress of exercise causes stronger muscles and a more resilient body.

Blueberries also cause stress in the body. Their small amount of toxicity causes hormetic stress and will trigger an excess release of glutathione (antioxidant) production in the cells. This glutathione production outweighs the negatives of the toxins in the blueberries. This is why blueberries are considered antioxidants and viewed as a net positive. Remember, this does not consider any of the adverse effects of antinutrients or fructose in blueberries.

Some argue that consuming small amounts of inflammatory oils, processed carbohydrates, and antinutrient vegetables is acceptable because of the effects of hormesis. Most people don't consume a little, but even if you consume small amounts, be aware of how your body reacts. While my body probably can tolerate blueberries and may get some small benefits, the net result may cause sugar cravings that aggravate my history of disordered eating. The net effect of my consuming blueberries is negative.

Getting better at something usually requires discipline, discomfort, and stretching ourselves to lengths we never thought we could go. If you want to be stronger, you should exercise. If you want to achieve your goals, you should focus on accomplishing something every day. Remember, what doesn't kill us will only make us stronger.

There are other ways of getting the benefits of hormesis:

- Heat exposure: saunas, infrared sauna, and steam rooms
- Cold-water exposure: cold-water plunges and ice baths
- Fasting
- Sunlight and tanning
- Red light therapy and near-infrared light

Fasting, Autophagy, and Basal Metabolic Rate

Fasting is a form of hormesis. Fasting is part of every religion. Some advocates of a carnivore diet do not believe fasting is necessary because a carnivore diet mimics fasting. Essentially you reap the benefits of fasting without having to stop eating altogether. When you intermittent fast (less than 24 hours) or extended fast (over 24 hours) while already eating a carnivore diet, the benefits of autophagy—the cleaning up of old broken-down cells—will be realized in a shorter period of fasting.[336]

If you struggle with disordered eating, be mindful of your reasons for fasting. Restrictive eating and eating disorders are dangerous. In fact, anorexia nervosa is the leading cause of death for people with mental health conditions. Don't use fasting to compensate for bingeing.

Wait until your body has fully adapted to eating fat and using fat as energy before incorporating fasting. When the body is adapted to a carnivore diet, people usually fall naturally into intermittent fasting or eating one to two times a day. Trust the body.

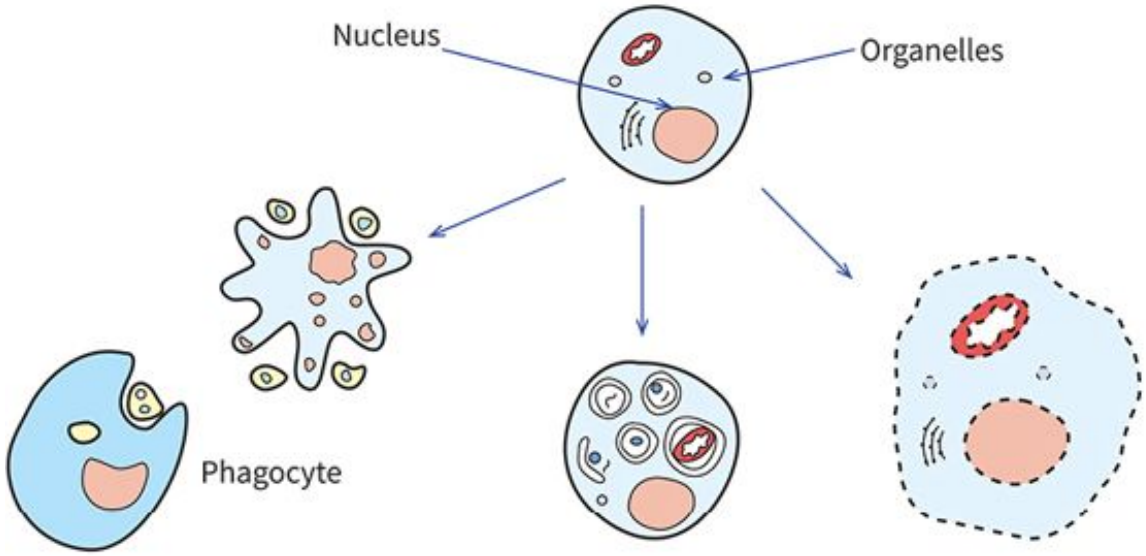
Since a carnivore diet is a fast-mimicking diet, you will reap some of these benefits even without fasting. But there are other benefits to fasting. Human growth hormone (HGH) helps to build muscle and bone mass, and fasting increases HGH production. Fasting promotes the preservation of muscle mass to help ensure human survival. A study published in the *Journal of Clinical Endocrinology and Metabolism* found that levels of growth hormone increased fourfold after just two days of fasting.[337]

Fasting also helps with autophagy. Fasting promotes the cellular cleansing process that breaks down and recycles damaged molecules and cells (autophagy). There is a similar process called apoptosis (programmed cell death) and necroptosis (another

programmed cell death). All these processes clean out old, damaged cells and make room for new, healthier cells (reference Figure 18.5)[338]

The most effective way to turn on autophagy is fasting. Studies in rodents show it takes about 48 to 72 hours for autophagy to be activated. In Figure 18.6, you can see the estimated benefits of fasting over time. Fasting becomes very individualized as someone fasting for weightloss should fast differently than someone fasting for autophagy. If you are on a carnivore diet, autophagy and other programmed cell deaths should come quicker to induce autophagy. Currently, there is no real way to measure autophagy in humans, but we do know what inhibits autophagy.[339]

TYPES OF NORMAL CELL DEATH



Phagocytes	Apoptosis	Autophagy	Necrosis
Phagocytes are cells that protect the body by ingesting harmful foreign particles, bacteria, and dead or dying cell.	Programmed cell death. Death cycle is programmed by the cell itself.	'Self-eating' Catabolic process involving lysosomes.	'Death' caused by external factors like trauma or toxins, not programmed.

Figure 18.5. Types of Normal Cell Death.

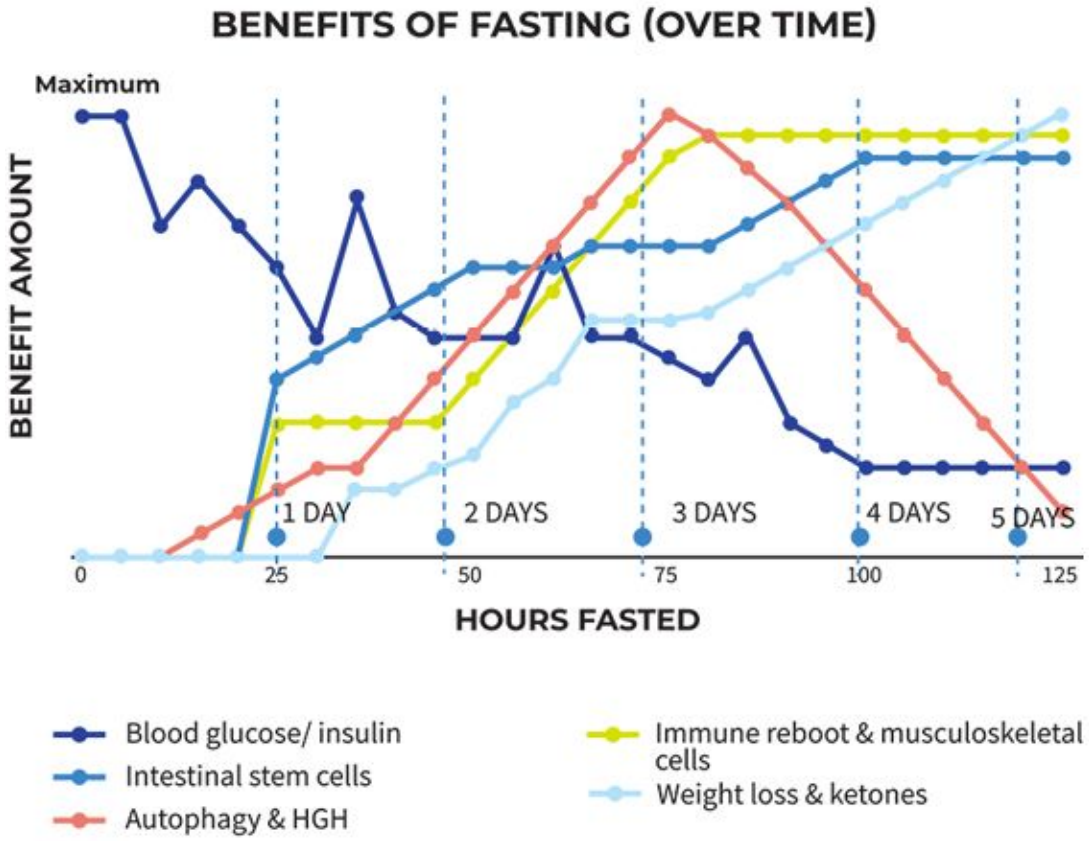


Figure 18.6. Adopted from: Pelz, Mindy, "Fasting Benefits Over Time," Dr. Mindy Pelz, (2020).

Carnivore and the long stretches without eating can turn on autophagy naturally, but proteins and amino acids decrease the need for activating autophagy (reference Table 18.8). When we eat protein, we turn on mTOR (master controller of protein synthesis and turns on cell growth) and essentially turn off autophagy. Excess calories can also suppress autophagy, increase mTOR, and turn down AMPK (a master switch regulating energy metabolism and fat burning). This begs the question: if you have one meal a day—of over 2,500 calories—will you ever turn on the benefits of autophagy?

It'll likely depend on how long you fast until r next meal, but this is another reason I'm not a big fan of having only one meal a day—bad for digestion and bad for cell cleaning.

WHAT SUPPORTS AUTOPHAGY?	
12 hours	• Fasting for just 12 hours can promote DNA repair.
72 hours	• Fasting for 72 hours can clear away 30% of the immune system and replenish it with brand new healthy immune cells.
Stress response of fasting	• The stress response from fasting causes the clean out of damaged DNA, protein aggregates, damaged mitochondria and the clearing out of entire cells that are bad (apoptosis).
Exercise and restorative sleep	• Both can support autophagy.

Table 18.7. What Supports Autophagy?

In terms of healing your metabolic rate, as Dr. Jason Fung, author of *Obesity Code,* writes,

> *The most important determinant of how much you eat is how hungry you are. Yes, you can deliberately eat less, but you can't decide to be less hungry. So, if you are constantly eating less, but are still hungry, it takes a toll on you [over time]. . . . And the moment you let your guard down, you are going to eat more. You are constantly fighting with your own body. Our metabolic rate [fluctuates 40 percent both ways,] depending on our hormones.*
>
> *Nobody decided they wanted to eat more so that they could get fat. They ate more because their hunger wasn't satisfied. And there are many different reasons for that—mental and physiological. Cutting calories when the problem is hormonal is not going to work. And guess what? It doesn't.*[340]

AUTOPHAGY INHIBITORS	
Amino acids and protein	• Decreases the necessity for activating autophagy as the body detects adequate amounts of nutrients. You can restrict your protein and not activate muscle protein synthesis but you'll still inhibit autophagy because of consuming some protein that activates mTOR. Protein restriction isn't an effective way of trying to increase autophagy or lifespan.
Insulin and IGF-1	• These signaling the presence of anabolic (builds up) nutrients that promote storage and growth. They will activate the Akt/mTORC1/p70S6K pathway that leads to muscle protein synthesis. This is the opposite of autophagy.
Carbohydrates	• Stop autophagy because of insulin and blood sugar rising. You can still be catabolic (breaks down) and with inactive mTOR while eating carbohydrates without protein but you'll still inhibit autophagy because of the presence of nutrients.
Excess calories	• Any macronutrient will suppress autophagy. High amounts of protein, carbohydrates, exogenous ketones or fat can all raise mTOR and insulin while suppressing AMPK. Although the spike of insulin isn't as high when consuming fat, it'll still be directed into storage eventually, thus decreasing the need for the body to conduct autophagy.

Figure 18.8. Autophagy Inhibitors.

One problem with nutrient-dense healthy eating is weight gain. Sometimes a person's basal metabolic rate (BMR) will be low from years of yo-yo dieting or undereating. The body has learned to use a

few calories to survive efficiently. When we start eating a normal range of calories, we begin to gain weight.

Because women tend to have a history of restricting calories, and our hormones are more complex than men's, women tend to struggle to lose weight more than men do.

How Do We Speed Up the Metabolism?

Getting restful sleep and exercise, drinking ice water or green tea (caution: oxalates), and eating spicy foods (caution: nightshades) can speed up the metabolism. Some practitioners recommend increasing caloric intake with light exercise to boost metabolism over time and then start cutting calories and increasing strength-training exercises.

Fasting is another option because of metabolism changes during fasting. In a four-day fasting study, participants dropped weight steadily. Their resting energy expenditure also increased during four days of fasting.[341]

If you measure how many calories you expend after four days of fasting, it's 10 percent higher than when you started because the body ramps up its energy output.

Ghrelin, the hunger hormone, is observed to gradually decrease after forty-eight hours of fasting. Yes, individuals are less hungry once they have fasted for more than forty-eight hours. Remember, hunger is a hormonally mediated state of mind. According to Fung, Ghrelin secretion is greater over time in women than in men, which means women can successfully fast longer than men.

The leptin hormone is secreted from fat cells and decreases hunger. It sends a signal to the brain that you are full, and you can stop

eating. This is why high-fat diets are likely to support longer periods of satiety.

People who are overweight typically have high leptin resistance, while leaner individuals typically have lower levels but higher sensitivity. Modern living, especially lack of sleep, greatly contributes to the disruption of leptin. Try to get restful sleep. If you felt hungrier the day after a poor night's sleep, this could be because of decreasing leptin levels. Cortisol does go up during fasting, but the benefits of fasting will outweigh the cortisol spikes.

Fasting is not useful for lowering cortisol. Just like exercise, fasting is a stress on the body. But both are beneficial with appropriate use. Fix the underlying issue of cortisol imbalances.

Meditation, deep breathing, exercise, and sleep are all methods of lowering stress. In fact, a study shows that even a single day of sleep deprivation can increase cortisol levels by over 100 percent.[342]

Fasting Options

After Dr. Jason Fung treated thousands of patients, he found that women should fast for at least thirty-six hours to maximize fasting for weight loss. Men should fast for a minimum of eighteen hours.

According to Fung,

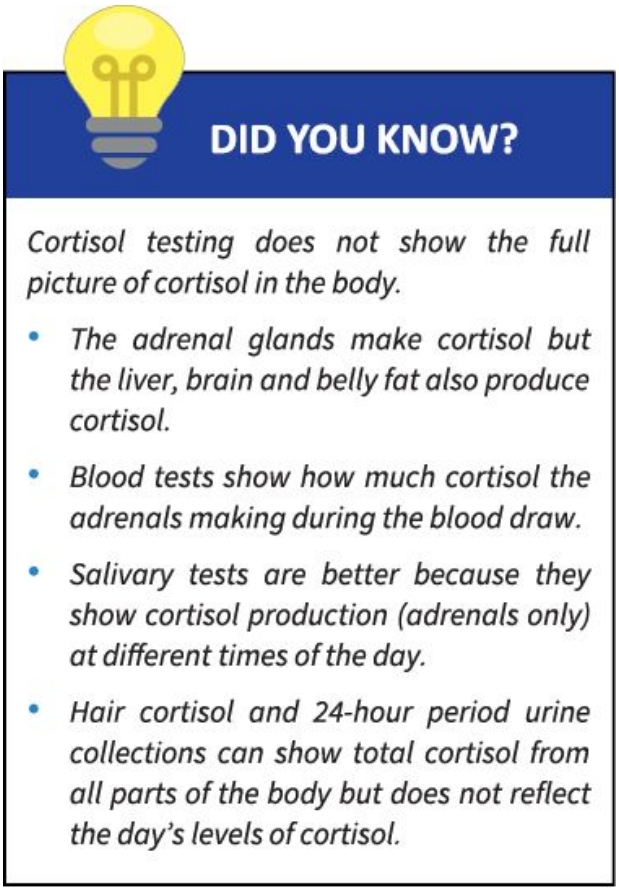
> *"Most non-diabetic men experience significant success following a 16:8 fasting regimen daily or fasting intermittently for 24 hours. Women don't appear to have the same success with either of those regimens. Most women, especially at the start, achieve success by doing 36 or 42 hours of intermittent fasting. It isn't a significant amount more than men, but it's just enough to have a significant impact on our waistlines. A 42-hour fast done three times a week has been the most successful fasting protocol for women looking to lose*

weight."[343]

One meal a day is not recommended outside of a maintenance weight, as the body may read it as calorie restriction and lower metabolism over time. Alternate day fasting is what Fung recommends for optimal metabolism healing and weight loss results.

Exercise

Exercising increases blood sugar levels momentarily and can help you feel more energized. I recommend monitoring blood glucose levels while fasting and exercising. It gives you a real-time reading of how you're doing while fasting.



Fasting and exercise produce temporary oxidative stress, which benefits the muscles. Exercising while fasting can also help manage stress and anxiety, boost growth hormone production, and improve

overall body composition. Exercising while fasting will also raise testosterone levels.

The body needs exercise. As exercise is a hormetic stress on the body, try working out in the morning when your cortisol is naturally higher. If it is physically hard to work out in the morning, get your cortisol checked.

One word of caution. If you struggle with adrenal imbalances, extended fasting and exercise can increase adrenal stress. You may want to avoid fasting until your adrenal function improves. When adrenal function is impaired, any bit of cortisol matters.

Lymphatic System and Exercise

We need to exercise for the health of the lymphatic system. The lymphatic system (organs, lymphocytes, and lymph) is a complex system of vessels all throughout the body that circulates bodily fluid and ultimately defends against infection. The lymphatic system is the body's drainage system; it cleans up waste from other bodily systems. The lymphatic system collects extra lymph fluid around the body's tissues and organs and returns it to the bloodstream. If the lymphatic system doesn't properly drain excess fluid from tissues, there will be buildup in the body that causes swelling.

The lymphatic system plays a critical role in the immune system as it contains antibodies that attack pathogens that can spread in the body. The lymphatic system also filters the blood and removes toxins from the body. The lymph passes through lymph nodes where white blood cells attack any invaders they find. The lymphatic system also removes toxins or impurities through sweat, breath, urine, and bowel movements.

The lymphatic system also plays a role in the exchange of nutrients, transfer of hormones, and the absorption of fat and fat-soluble

nutrients in the intestines. Although the lymphatic system isn't well known to the general public, it plays a critical part in the body, especially in the body's ability to properly detoxify.

The vessels in the lymph system (lymph fluid) travel through the tissues. Unlike the heart that pumps blood, there is no pump for the lymphatic system. We need our lymph fluid to move so that swelling does not occur. You need to move in order to support your lymphatic system.

Bones and Exercise

The bones are living tissues, and they change based on the force placed on the bones. Simply put, the more we exercise regularly, the more our bones will adapt by building additional cells and becoming denser and stronger.

Weight-bearing exercises force the body to work against gravity. This includes walking, jogging, and resistance exercises like weight training. Jumping can help not only to strengthen the bones but to move the lymph fluid. Exercise is essential for strengthening bones.

Gut Health and Exercise

Exercise increases butyrate (nutrients for gut health). Studies found that exercise enhances butyrate-producing fecal bacteria and increases overall butyrate production. If you are worried you aren't consuming enough butter, make sure to get in some exercise.[344]

When we exercise, the body sends blood to the muscles, moves it away from the gut. Due to the restriction of blood to the gut, the gut becomes more permeable during exercise. Imagine all those granola nut bars (antinutrients) people consume while running marathons. Granola bars with its high antinutrient content (oxalates, lectins,

phytates) are more toxic to the body during exercise—when the gut is more permeable.

Mental Health and Exercise

Exercise releases endorphins (feel-good hormones created in our neurotransmitters). Studies have shown that higher-intensity exercises release more endorphins than lower-intensity exercises.[345]

Exercise also helps with mental health by reducing stress. In fact, just five minutes of exercise can trigger antianxiety responses. Stress is a common reason people have a hard time falling asleep—turning off the fight-or-flight state is difficult. Yoga, Pilates, stretching, and other forms of movement can help you to relax.[346]

Remember, yoga and other mind-body exercises help to support our telomere length (for longevity) and can also reduce blood pressure, lower cortisol levels, and support positive moods.

Walking is important because leg exercises have been shown to stimulate brain cells.[347]

Sleep, Exercise, and Too Much Exercise

When we have physically strenuous days, we tend to sleep hard. Exercise increases the time spent in deep, restorative sleep. Deep sleep supports cardiac health, boosts immune function, and helps control anxiety and stress. When you exercise, you expend more energy than usual, which helps to make the body tired by night, and that, in turn, benefits sleep quality and overall sleep duration.

But too much exercise is not good. Boot camps and CrossFit types of exercise can be harmful. Excessive exercise or overtraining has been shown to have adverse effects on adrenal health and even

cause hypothyroidism. Excessive exercise, like high stress, produces cortisol, which is harmful to the body.[348]

Acute cortisol responses can disturb sleep, adversely affect moods, cause digestive issues, and even weight gain. Excessive cortisol causes weight gain around the abdomen. Marathoners are affected by the acute cortisol response. Too much cortisol also causes hormonal disruptions by overburdening the adrenals. In fact, several studies show that marathoners and endurance athletes experience physiological stress with temporary immunodepression and high risks of infection. Yes, marathoners can impair their immune systems. Researchers have found changes in cardiac biomarkers, digestive problems, and gastrointestinal bleeding in ultramarathoners. Some ultramarathoners may be thriving, but for most people, it is not the best sport for longevity. In fact, overexercising has also been found to cause osteopenia and gut permeability.[349]

Swelling and inflammation are also common after intense exercise. Remember hormesis? Maybe marathoners, ultramarathoners, and others engaged in excessive exercising are going past the point of positive outcomes. Maybe the benefits are not greater than the negatives.

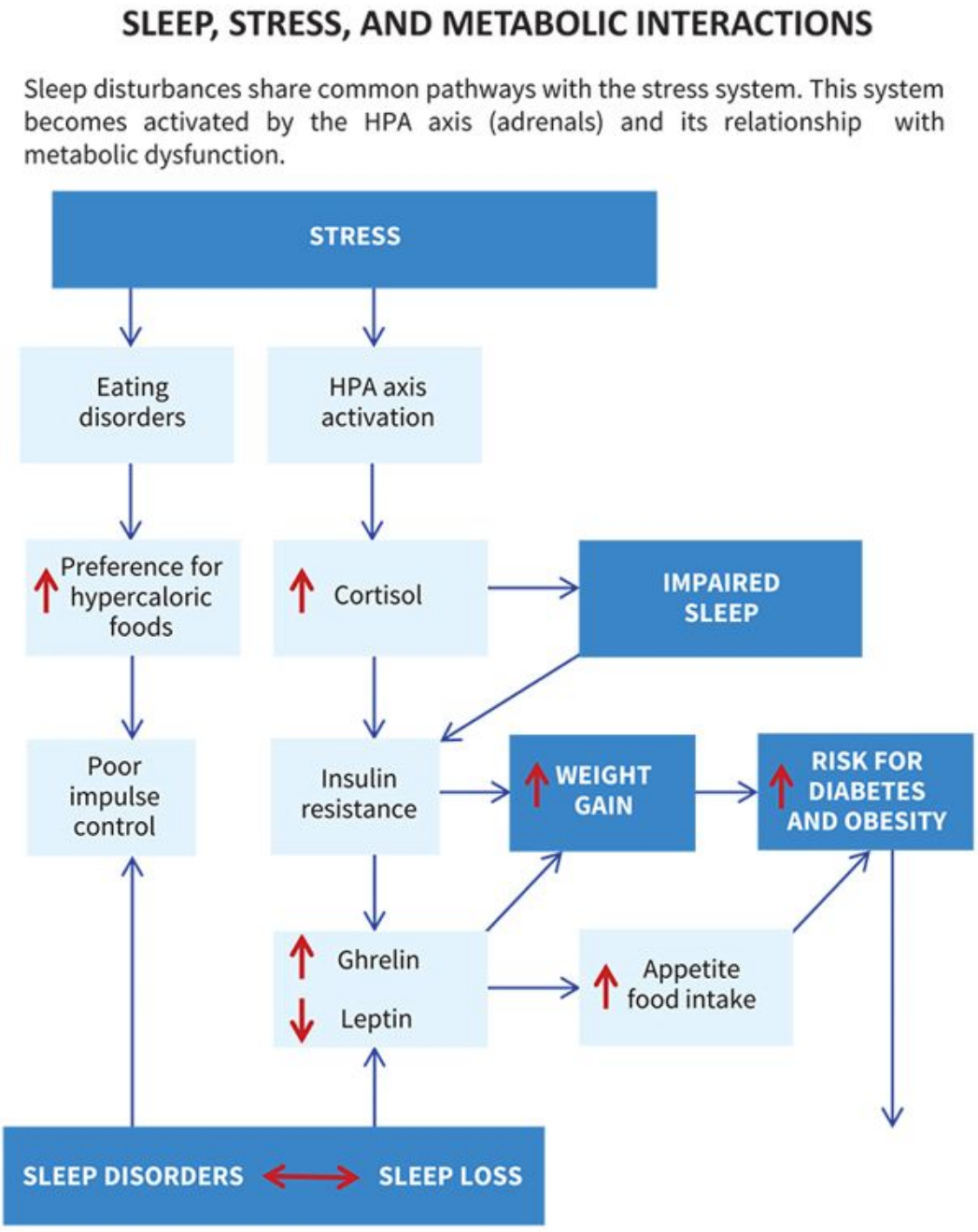


Figure 18.9. Hirotsu, Camila et al., "Interactions Between Sleep, Stress, and Metabolism," *Sleep Sci*, 8(3). (2015): 143-152.

Excessive exercise has shown to adversely affect neurotransmitters, including glutamine, 5-HTP, and dopamine. Disruptions in these neurotransmitters can cause chronic fatigue and depressed feelings.

How much exercise is too much? There is no right answer. Go by what your body tells you, but if you are doing CrossFit every day,

you're probably exercising too much. Swimming, hiking, and walking are great alternatives. Because hikers like to set off together, their community makes hiking an option with multiple benefits.

When you do work out, be sure to hydrate properly. Drinking water right before you work out is not sufficient. If you properly hydrate before and after a workout, you shouldn't experience any post-exercise food cravings. Those cravings tend to come because of dehydration. Drink a cup of water with mineral salt or a cup of bone broth or meat stock forty-five minutes before you work out. This will help stave off any dehydration concerns while balancing your electrolytes.

Meditation

The body is not designed to be chronically stressed. I've talked about how telomeres can increase with mind-body activities (yoga). Meditation allows us to relax, which then helps the body reduce stress. We need to reduce stress because it directly affects mental health and gut health. When we reduce stress, we support the health of our microbiome. It's a positive cycle: when the microbiome is good, it will produce feel-good hormones from neurotransmitters, such as dopamine, serotonin, and GABA (more GABA means less anxiety), as well as smaller amounts of norepinephrine (more norepinephrine means more anxiety). When the microbiome isn't balanced, we produce fewer positive hormones and neurotransmitters.

Stress begets stress.

Remember, butyrate is produced by our gut bugs. Butyrate also influences the levels of the master antioxidant (glutathione) in the body. Glutathione production can increase with meditation. One

study showed that yogis had 20 percent higher levels of glutathione than non-yogis.[350]

Another study showed that just eight weeks of a mindfulness meditation program altered the brain structure of the participants after an average of twenty-seven minutes of meditation daily. Brain MRIs of subjects showed their hippocampus had increased gray matter density—the prefrontal cortex, which is the rational part of the brain governing learning, memory, and introspection—and decreased gray matter in the amygdala, the emotional part of the brain (anxiety, stress). Increasing the gray matter density of the prefrontal cortex is desirable.[351]

As we age, the prefrontal cortex starts shrinking as the brain shrinks. As we age, we tend to run more on the emotional part of the brain. A study of fifty-year-olds who consistently meditated showed they had the same gray matter density in their prefrontal cortex as twenty-five-year-olds.[352]

That's powerful. We need to meditate for longevity, gut health, and overall mental health.

Removing Environmental Toxins

This section can be a whole book. I will touch on some aspects, but I recommend doing some additional research. The thought of removing all the toxins we encounter every day is daunting. My husband always tells me to live in a bubble, but that would also be impossible because it would have to be made of some type of plastic.

Take it one item at a time, one day at a time, and find the things that you are willing to change. It's impossible to live 100 percent free of toxins, and the body can purge itself of many of them. Additionally,

the problem does not lie in individual sources of toxins but in the constant exposure to a panoply of toxins that causes irreversible harm to the body.

Find the balance that works for you.

Plastics

I've talked about how bisphenol-A (BPA) in plastics is harmful. It causes estrogen-mimicking effects in the body. The Food and Drug Administration recently banned BPA from infant formula cans, and it is now being removed from sippy cups and baby bottles. Europe and Canada have completely banned BPA.[353] However, it remains in many other products.

Estrogen-mimicking toxins are overloading our bodies and putting us at risk of infertility, reproductive cancers, and metabolic disorders.

Never microwave or heat foods in Styrofoam or plastics, such as Saran wrap and plastic microwave covers. This is because BPA leaches out of plastics into foods, especially when plastics are exposed to heat. The same holds for dishwashers and plastics.[354] At the very least, limit your consumption of drinks in plastic bottles. You may have bought that bottle of Coke from a refrigerator case, but you can bet that in the summer, it spent time aboard an unrefrigerated tractor-trailer.

Phthalates

Phthalates are endocrine disruptors that can adversely affect reproduction and normal development. They can block the normal function of the thyroid hormone. Phthalates are detectable in urine tests and are more often found in women than men because they are in many personal care products and cosmetics. They also are

found in vinyl flooring, rubber gloves, plastic wraps, plastic food containers, toys, food packaging, and much more.[355]

Buy phthalate-free items for personal care and choose glass or stainless steel for containers.

Drinking-Water

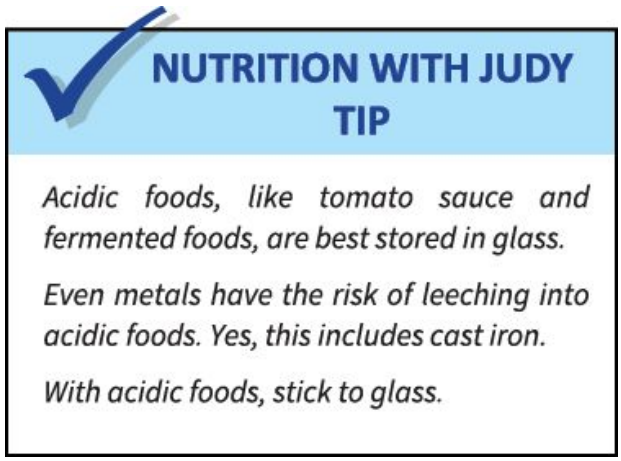
Many water filtration systems need multiple filters to remove different toxins. Buying a water filter for your refrigerator isn't sufficient because purifying water is difficult. Depending on where you live, you will need specific water filters over other filters. I was planning to install a full-house water filtration system. They are very costly, but with young kids and their constant use of water, it seemed like the safest option—until I found out that some of these systems can be breeding grounds for mold and bacteria.

My search is not over, but for now we have a kitchen water filtration system and a filtered showerhead. Many health practitioners favor a water filtration system that sits on top of countertops. This system requires two filters and can be costly. I have found a similar model that is much more economical and requires only one filter. You can find the brand I use in the resource section at www.carnivorecure.com/resources.

Cookware

Stick to glass and stainless steel. Bamboo is another option, but it may not be ideal environmentally (too often, forests are cleared to make way for bamboo production). Some reports show that stainless steel may cause metal toxicity if the outer lining is compromised by harsh, abrasive materials or if the stainless-steel cookware is of poor quality.[356]

Glass cookware may be a safer option. Teflon and other nonstick cookware can emit toxic chemicals and gases.[357] Stick to stainless steel (limited), glass, and cast-iron cooking pots and pans. Cast-iron cooks meat more evenly anyway. Cast-iron can seem intimidating to maintain, but with practice comes the ease of use.



Personal Care

Our skin is the first defense against disease. More than a trillion microbes live on our skin, as the skin is our largest barrier to the external environment. This is why hand sanitizers and antibacterial soaps can be dangerous—they may remove some harmful germs, but the frequent use kills many good microbes. The best option is to wash hands with water and soap with the least fragrance, dyes, and toxins.

The Environmental Working Group and the “Think Dirty” app are great resources for identifying products with toxic ingredients. Instead of being loyal to a specific brand, I use these ingredient lists to determine if a product is worth buying. When it comes to cleaning products, lately, I’ve been keeping it simple. I use some vinegar, lemon, and baking soda. Sometimes I’ll use hand soap, and unscented baby wipes to clean areas around the house. Usually, hot water and a rag do just fine. We don’t need our homes to be spotless

and chemically scented all the time, especially when it doesn't do a body good.

Sunscreen

Sunscreen is a multibillion-dollar industry, yet no studies prove that the use of sunscreen protects us from melanoma and basal carcinoma. In fact, the fatal types of melanoma usually occur in areas of the body that never see the sun (the bottom of your foot and the anus).[358]

However, since 1978, when the first UVA sunblock was marketed, sunscreen sales have soared. But so has melanoma. Studies have also found that sunscreen can cause leaky gut, hormonal dysfunction, and neurological dysfunction.[359]

Research by the Environmental Working Group has found that chemicals in sunscreen are significant endocrine disruptors. Sunscreen is estrogenic, a potent anti-testosterone, and may cause other adverse hormonal effects by interfering with the thyroid. Of the more than fourteen hundred sunscreens tested, only 5 percent met the EWG's safety standards, and more than 40 percent were considered skin cancer contributors.[360]

When you first go outside on a sunny day, antioxidants protect you. When these antioxidants can no longer protect you, your skin starts to burn. When you use sunscreen, you are blocking only the 4 percent of ultraviolet light (UVA and UVB), but the 47 percent infrared goes much deeper into the skin and the mitochondria (cell's energy source). When you wear sunscreen, you block the sun's burn, so you stay longer than your skin can handle. Then the 47 percent of infrared gets into the skin, causing more severe damage to the body.[361]

Trust the body's innate wisdom: the burn you feel is the skin's warning that your body has had enough sun, and it is time to find some shade.

The reason you tan is melanin. Melanin protects the skin and cells from oxidation. This radiation causes the body to make vitamin D, an important anticancer defense for all of the body. Most sunscreens completely block the body's ability to make vitamin D. As a result, 75 percent of Americans are deficient in vitamin D, and vitamin D deficiency is linked to higher risks of cancer.[362]

Here are some common ingredients in sunblock and their adverse effects:

- *Zinc titanium oxide.* Small particles of zinc titanium oxide get into the body, brain, and liver, injuring the brain and a pregnant woman's fetus. Multiple studies show how varying amounts of titanium oxide alter genes. In one study, newborn mice were found to have 1,881 genes altered by titanium oxide.[363]
- *Synthetic estrogens.* Many sunscreens contain synthetic estrogens such as benzophenone-3 (Bp-3), homosalate (HMS), 4-MBC, OD-PABA, and others. The skin absorbs them, and they can induce breast cancer, ovarian and uterine cancer, and infertility in men and women, as well as abnormal and premature puberty in children.[364]
- *Oxybenzone.* A study that relied in part on surveys and lab work by the Centers for Disease Control and Prevention found oxybenzone, a chemical that helps other chemicals better penetrate the skin, in 97 percent of the population. Oxybenzone is considered an endocrine disruptor linked to skin allergies, cell damage, and reduced sperm count in

men, and it may be implicated in endometriosis in women.[365]

This chemical is found in the bloodwork of almost all Americans, even people who have never used sunscreen, because it is in our water sources and cannot be removed at water plants or by water filters. Maybe this is why Hawaii has started banning all sunscreens that contain oxybenzone and octinoxate. These chemicals are killing coral in just four days, bleaching them white. If it can do that to coral, imagine what it does to your skin.[366]

All Neutrogena sunscreens are high in oxybenzone. The Environmental Working Group advises against use of oxybenzone for children and women who are pregnant or breast-feeding.

Zinc oxide and titanium are considered safe for kids but not foolproof. These chemical ingredients can go directly into the brain and disrupt its development, which could be dangerous for kids who use a lot of sunblocks. By the time they are adults, they may have some neurological dysfunction.[367]

Protecting Yourself from the Sun

The ideal is to cover up and not go out in the sun during peak times of ultraviolet and infrared rays. If skin cancer doesn't run in your family, you have even less reason to be using sunscreen.

Dr. Elizabeth Plourde, a clinical laboratory scientist and health educator, recommends determining your body's current capacity to stay in the sun by considering the following:

- Your skin type and its current capacity to stay in the sun.
- The time of day—check the UV Index to determine the strength of the sun. Better is to swim after 4 or 5 p.m. or go

out earlier in the day and spend only for fifteen minutes at a time in the sun.

- Avoid the sun when it is directly overhead.
- Monitor your skin to make sure it is not uncomfortable or turning red.
- If you have to stay in the sun for extended periods, bring tightly woven clothing (hats, long-sleeved shirts, and pants), so you can cover up when your skin has had enough sun.[368]
- Eat foods with more antioxidants (salmon and oysters), so you can give your body protection from the sun and boost the body's vitamin D.

If you choose to use sunscreens, mineral sunscreens are the better option, free of parabens, phthalates, and synthetic fragrances. Mineral sunscreens usually contain titanium and zinc, so during a summer vacation at the beach, it becomes a question of being smart about your choices. Some mineral sunscreens do not contain zinc and will not harm coral reefs.

Harmful Toxins

Heavy metal toxicity is becoming a common health issue. Heavy metals can enter our body in different ways (oral, breath, skin), and this is dangerous because the body has a difficult time removing heavy metals. You can get tested for heavy metal toxicity if you have feelings of general malaise, and nothing else (changes in diet, exercise, sleep, stress) seems to help. Chelation therapies may be the best way to detoxify heavy metals, but you must work with a medical practitioner. Refer to Chapter 16 for more detoxification support.

Lead

Lead is most problematic for the nervous system. Children are especially vulnerable to lead poisoning, as even low levels can impact learning and cause lower IQs and behavioral issues. Damage to the brain and kidneys, anemia, and respiratory infection are all associated with lead toxicity. In children, it is also associated with hyperactivity disorders because their nervous system is adversely impacted by lead exposure.[369]

Lead can be found in our waters, wrappers for imported candies, gasoline, painted dishes, paint, imported toys, kids' jewelry, and canned foods.

Mercury

Mercury is a neurotoxin and accumulates in the central nervous system, liver, and kidneys. Some forms of mercury cross the blood-brain barrier and cause cognitive and mood issues.[370]

Mercury can be found in fish, but the main concerns for mercury toxicity don't involve fish. Thermostats, lightbulbs, batteries, auto parts, and skin creams may contain mercury. Mercury is also found in corn sweeteners such as corn syrup, sodium benzoate (food preservative), and food coloring. Inhaling elemental mercury from a broken thermometer is extremely toxic to your nervous system, lungs, and kidneys.[371]

Dental amalgams are made up of more than 50 percent mercury, which releases methyl mercury, and is dangerous because it's attracted to tissues and organs.[372] It is one of the few chemicals that *can* cross the blood-brain barrier. Most European countries, Canada, and Japan have extensive bans on amalgam fillings. The U.S. Environmental Protection Agency classified mercury as a hazardous waste in 1988. So, while toxicologists consider mercury to be one of

the most poisonous substances, it has been considered safe because it occurs naturally.

Mercury also can be passed down to babies if the mother had dental amalgams while pregnant. But the main exposure for children is vaccinations. Tables 18.10-18.12 share some of the most common ingredients in vaccinations.[373]

Twenty-five to thirty percent of vaccinations contain mercury as a preservative. Flu shots contain high levels of mercury. Vaccine makers sometimes swap mercury for formaldehyde and aluminum. According to the FDA's information guide, Thimerosal (a preservative) in vaccines is approximately 50% mercury (Hg) by weight.[374]

WHAT'S IN A VACCINE?
PER THE CDC

INGREDIENT TYPE	EXAMPLE	PURPOSE	COMMON SOURCES
Adjuvant	• Aluminum	• To help boost the body's response to vaccine	• Antacids • Buffered aspirin • Antiperspirants • Drinking water • Infant formula
Preservatives	• Thimerosal (only in multi-dose vials of flu vaccine)	• To prevent contamination	• Eating foods such as certain fish that contain mercury
Residual antibiotics	• Neomycin	• To prevent contamination bacteria during the vaccine manufacturing process	• Antibiotics that people can be allergic to aren't used in vaccines (e.g., penicillin)
Residual cell culture materials	• Egg protein	• To grow enough of the virus or bacteria to make the vaccine	• Eggs
Residual inactivating ingredients	• Formaldehyde	• To kill viruses or inactivate toxins during the manufacturing process	• Automobile exhausts • Household carpet • Household upholstery
Stabilizers	• Gelatin • Sugar	• To keep vaccine effective after manufactured	• Jell-O

INGREDIENT AMOUNTS IN VACCINES

VACCINE INGREDIENTS & THE AMOUNTS A CHILD RECEIVES FROM VACCINES IN THE FIRST 6 YEARS OF LIFE			
2-phenoxyethanol	• 17,500 mcg	Polymyxin (antibiotic)	• 0.075 mcg
Aluminum	• 5,700 mcg	Potassium chloride	• 116 mcg
Fetal bovine serum	• Unknown	Potassium phosphate	• 188 mcg
Formaldehyde	• 801.6 mcg	Sodium hydroxide	• Unknown
Gelatin	• 23,250 mcg	Sodium phosphate	• 2,800 mcg
Human albumin	• 500 mcg	Sorbitol	• 32,000 mcg
MRC-5 cells (aborted human cells)	• Unknown	Sucrose	• >40,000 mcg
MSG	• 760 mcg	Urea	• 5,000 mcg
Neomycin (antibiotic)	• >10 mcg	Yeast protein (fungus)	• 35,000 mcg

Table 18.10. What's in a Vaccine. CDC. https://www.cdc.gov/vaccines/parents/ingredients.html.

VACCINE INGREDIENTS (1 of 2)

SOURCE MANUFACTURER'S P.I. DATED: 2013-2019

Aborted fetal tissues are oftentimes used in vaccines. Some of the fetal tissues are in identified in CAPS.

VACCINE	INGREDIENTS	
Adenovirus	• HUMAN DIPLOID FIBROBLAST CELL CULTURES • Dulbecco's modified eagle medium • Fetal bovine serum • Sodium bicarbonate • Monosodium glutamate (MSG) • Sucrose • D-mannose • D-fructose • Dextrose • Human serum albumin • Potassium phosphate	• Plasdone C • Anhydrous lactose • Microcrystalline cellulose • Polacrilin potassium • Magnesium stearate • Cellulose • Acetate Phthalate • Alcohol • Acetone • Castor oil • Yellow dye #6 • Aluminum lake dye
DTaP (Daptacel)	• Aluminum phosphate • Isotonic sodium chloride • Formaldehyde • Casein • Cystine	• Maltose • Uracil • Inorganic salts • Vitamins • Dextrose
DTaP (Infanrix)	• Fenton medium containing a bovine extract • Modified Latham medium derived from bovine casein • Formaldehyde	• Modified Stainer-Scholte liquid medium • Glutaraldehyde • Aluminum hydroxide • Sodium chloride • Polysorbate 80 (Tween 80)
DTaP-IPV (Kinrix)	• Fenton medium containing a bovine extract • Modified Latham medium derived from bovine casein • Formaldehyde • Modified Stainer-Scholte liquid medium • Glutaraldehyde • Aluminum hydroxide	• VERO cells • Continuous line of monkey kidney cells • Calf serum • Lactalbumin hydrolysate • Sodium chloride • Polysorbate 80 (Tween 80) • Neomycin sulfate (antibiotic) • Polymyxin B (antibiotic)
DTaP-IPV (Quadracel)	• Modified Mueller's growth medium Ammonium sulfate • Modified Mueller-Miller casamino acid medium without beef heart infusion • Formaldehyde • Aluminum phosphate • Stainer-Scholte medium • Casamino acids • Dimethyl-beta-cyclodextrin • MRC-5 CELLS	• NORMAL HUMAN DIPLOID CELLS • CMRL 1969 medium supplements with calf serum • Medium 199 without calf serum • 2-phenoxyethanol (antifreeze) • Polysorbate 80 • Glutaraldehyde • Neomycin (antibiotic) • Polymyxin B sulfate (antibiotic)
Hep A (Havrix)	• Aluminum hydroxide • Amino acid supplement • Polysorbate 20	• Formalin • Neomycin sulfate (antibiotic) • MRC-5 cellular proteins
Hep A/Hep B (Twinrix)	• Formalin • Yeast protein • Aluminum phosphate • Aluminum hydroxide	• Amino acids • Phosphate buffer • Polysorbate 20 • Neomycin sulfate (antibiotic) • MRC-5 HUMAN DIPLOID CELLS
Human Papillomavirus (HPV) (Gardasil 9)	• Amorphous aluminum hydroxy phosphate sulfate • Sodium chloride • L-histidine	• Polysorbate 80 • Sodium borate • Yeast protein

Table 18.11. Vaccine Ingredients. https://www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/b/excipient-table-2.pdf.

VACCINE INGREDIENTS (2 of 2)
SOURCE MANUFACTURER'S P.I. DATED: 2013-2019

Aborted fetal tissues are oftentimes used in vaccines. Some of the fetal tissues are in identified in CAPS.

VACCINE	INGREDIENTS		
Influenza (Fluad)	• Monohydrate • Neomycin • Kanamycin • Barium	• Hydrocortisone • Egg proteins, • Formaldehyde • Squalene	• Cetyltrimethylammonium bromide • Polysorbate 80 • Sorbitan trioleate • Sodium citrate dehydrate
Influenza (FluMist) Quadrivalent	• Ethylene diamine tetra acetic acid (EDTA) • Monosodium glutamate (MSG) • Hydrolyzed porcine gelatin • Arginine		• Sucrose • Dibasic potassium phosphate • Monobasic potassium phosphate • Gentamicin sulfate (antibiotic) • Egg protein
Japanese Encephalitis (Ixiaoro)	• Aluminum hydroxide • Vero cells • Protamine sulfate • Formaldehyde		• Bovine serum albumin • Sodium meta bisulphite • Sucrose
Meningococcal (MCV4-Menactra)	• Formaldehyde • Phosphate buffers • Mueller Hinton agar • Watson Scherp media		• Modified Mueller and Miller medium • Detergent • Alcohol • Ammonium sulfate
Meningococcal (MCV4-Menveo)	• Formaldehyde • Amino acids • Yeast extract		• Franz complete medium • CY medium
Meningococcal (MCV4-Menomune)	• Thimerosal (multi-dose vial only) • Lactose • Mueller Hinton casein agar		• Watson Scherp • Detergent • Alcohol
Meningococcal (MenB-Bexsero)	• Aluminum hydroxide • Escherichia coli *(E. coli)* • Histidine		• Sucrose • Deoxycholate • Kanamycin
Meningococcal (MenB-Trumenba)	• Polysorbate 80 • Histidine		• Escherichia coli *(E. coli)* • Fermentation growth media
MMR (MMR-II)	• Medium 199 (vitamins, amino acids, fetal bovine serum, sucrose, glutamate) • Minimum essential medium • Phosphate • RECOMBINANT HUMAN ALBUMIN		• Neomycin (antibiotic) • Sorbitol • Hydrolyzed gelatin • Chick embryo cell culture • WI-38 HUMAN DIPLOID LUNG FIBROBLASTS
Varicella (Varivax)	• Sucrose • Phosphate • Glutamate • Gelatin • Monosodium glutamate (MSG) • Sodium phosphate dibasic • Potassium phosphate monobasic • Potassium chloride • Sodium phosphate monobasic • Potassium chloride		• Ethylene diamine tetra acetic acid (EDTA) • RESIDUAL COMPONENTS OF MRC-5 CELLS INCLUDING DNA AND PROTEIN • Neomycin (antibiotic) • Fetal bovine serum • HUMAN DIPLOID CELL CULTURES (WI-38) • Embryonic guinea pig cell cultures • HUMAN EMBRYONIC LUNG CULTURES
Zoster (Shingles-Zostavax	• Sucrose • Hydrolyzed porcine gelatin • Monosodium glutamate (MSG) • Sodium phosphate dibasic • Potassium phosphate monobasic		• Neomycin (antibiotic) • Potassium chloride • RESIDUAL COMPONENTS OF MRC-5 CELLS INCLUDING DNA AND PROTEIN • Bovine calf serum

Table 18.12. Vaccine Ingredients. https://www.cdc.gov/vaccines/pubs/pinkbook/downloads/appendices/b/excipient-table-2.pdf.

Aluminum

In Chapters 2 and 3, I discussed how aluminum is used in heartburn medicine as well as in kitchen staples such as aluminum foil. Aluminum is a neurotoxin that has been linked to autism. Aluminum can be found in antiperspirants, food and drink containers, cookware, baby formula, vaccinations, antacids, aluminum foil, and pots and pans. When heated, aluminum easily leaches into foods and cookware.[375]

This is why I avoid aluminum foil and am using stainless steel pans or using parchment paper when cooking.

Fluoride

Fluoride treatment is offered as an additional charge during dental visits. For decades, dentists have used fluoride to promote healthy enamel and fight against dental caries, gum disease and enamel-destroying bacteria. Because of its ability to find cavities, fluoride is in most toothpaste and commonly in children's dental products.

Fluoride is stored in our bones and can cause endocrine dysfunction, neurotoxicity, and other toxicities of the heart, kidneys, and liver. Infants can have up to a 90 percent retention rate of fluoride stored in the brain. Fluoride has also been found to cause learning problems in children.[376]

The best way to prevent cavities is by removing sugary foods from the diet. Fluoride is found in water sources, dental products, Teflon cookware, green and black teas, and pesticides.[377]

Chlorine

The chlorine we put in our pools can be toxic. Chlorine has been found to kill good gut bacteria, mimic estrogen, and even cause weight gain. We know not to drink the pool water, but even inhaling

chlorine can be harmful. This may be why the first whiff of an indoor, heavily chlorinated pool feels like getting hit in the face.

It's difficult to find swimming pools that don't use chlorine, but freshwater swimming is always an option; another is using or maintaining a saltwater swimming pool. Always get filters that remove chlorine from your drinking water.

Medications

Trace amounts of prescription and over-the-counter medications have been found in drinking water. In one study found Chinese tap water had higher risks for traces of livestock medications, antibiotics, and antibacterials.[378]

Remember, the body is 60 percent water. We need to hydrate with water that is not filled with harmful toxins.

Blue Light

Blue light inhibits the brain's production of melatonin, which is the hormone that helps us sleep. To avoid blue light that decreases our melatonin, turn off electronic devices when the sun goes down, wear blue-blocker glasses, and install apps on computers and phones to reduce blue light. Additionally, incandescent lights have far less blue light than LED and fluorescent lights.

A note about melatonin: melatonin is a type of hormone therapy. Supplementing melatonin is not ideal. As I've discussed the importance of the body finding homeostasis, there is also a melatonin balance that the body needs. Although melatonin regulates sleep and our internal body's clock, it does not initiate sleep. Insomnia is not caused by a deficiency in melatonin. Melatonin does not make us sleepy. Supplemental melatonin seems

to be effective because it induces a drowsy feeling as it is a stress hormone, often misread as sleepiness.

Find the root cause of insomnia.

Electromagnetic Fields

There are different types of electromagnetic fields (EMFs) and different frequencies. Too much exposure to high-frequency radiation, such as X-rays, can be harmful. Bluetooth products, Wi-Fi products, baby monitors, microwaves, smart meters, and cell phones use low-frequency EMFs, which can cause harm, even if it not always immediate. Low-frequency EMFs should be rated based on frequency, duration of exposure, power density (average energy of waves in the area), and strength. In fact, the WHO's International Agency for Research on Cancer has categorized low-frequency EMFs as a possible carcinogen. Wi-Fi has been found to cause headaches in schoolchildren, and smart meters (meters attached to homes and offices that wirelessly transmit usage information back to utility companies) have been found to have an array of adverse health effects. Other symptoms include fatigue, anxiety, brain fog, depression, dizziness, frequent illness, insomnia, and adrenal (HPA axis) dysfunction). EMFs can bypass the blood-brain barrier and allow mercury and pesticides to enter the brain and cause neurodegenerative disease.[379]

Using cell phones by the head for just 30 minutes a day can increase brain tumor risks by 40 percent, and 24 hours of EMF exposure can induce more DNA damage than sixteen hundred chest X-rays. Many European countries are banning WiFi in schools.[380]

EMF AND THE HUMAN BODY

According to some scientists, EMFs can affect your body's nervous system function and cause damage to cells. Cancer and unusual growths may be one symptom of very high EMF exposure. Other symptoms may include:

- Sleep disturbances, including insomnia
- Headache
- Depression and depressive symptoms
- Tiredness and fatigue
- Dysesthesia (a painful, often itchy sensation)
- Lack of concentration
- Changes in memory
- Dizziness
- Irritability
- Loss of appetite and weight loss
- Restlessness and anxiety
- Nausea
- Skin burning and tingling
- Changes in an electroencephalogram (which measures electrical activity in the brain)

The symptoms of EMF exposure are vague and diagnosis from symptoms is unlikely. We don't know enough about the effects on human health. Research in the next years may better inform us.

Table 18.13. EMF and the Human Body.

5G is a concern as it dramatically increases EMF exposure.

But there are some things you can do to limit your EMF exposure.

- Check your home with EMF readers.
- Limit wireless and smart appliances.
- Use hardwired connections instead of Wi-Fi.
- Use airplane mode at night.
- Turn appliances and devices off at night.
- Keep electronics out of the room where you sleep.
- Avoid Bluetooth wearables (I stopped wearing my Apple iWatch).
- Switch to phones that use 3G or 4G (older cell phones have this option).
- Ask your gas or electric company to remove smart meters from your home.
- Charge phones in a room you don't spend a lot of time in.
- Filter your dirty electricity. (bad electric writing causing more emissions from low frequency electromagnetic fields and radiofrequency radiation).
- Keep electronics away from the body as much as possible.
- Limit use of electronics and Wi-Fi as much as possible. Connect computers directly (hardwire) to the internet router, instead of using Wi-Fi (wireless). Use fewer USB products and smart electronics.

Grounding or earthing (walking outside barefoot) can help reconnect the body to earth by rebalancing electrical charges in the body. Remember, our skin absorbs nutrients and toxins. When we touch the dirt with our feet, we absorb ions and other electrical charges from the ground. When traveling, grounding can support the body to rebalance the circadian rhythm.

Figure 18.14 depicts the ever-increase amounts of EMF exposure. Although the research is still in its infancy, grounding can allow the body to neutralize positive ions from EMFs. Other research shows that grounding may also help counter inflammation, cardiovascular disease, chronic pain, and mood disorders.[381]

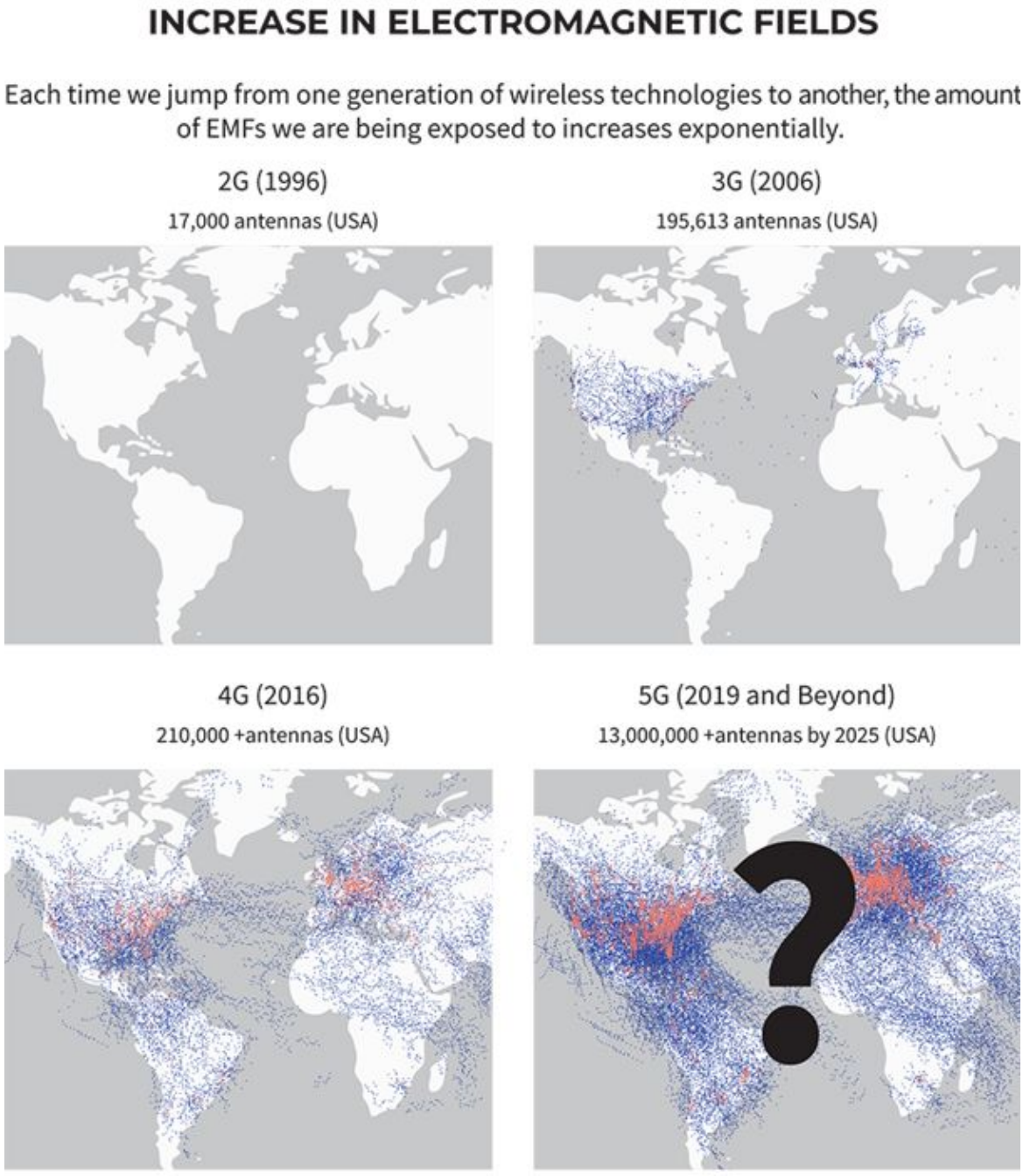


Figure 18.14. Increase in Electromagnetic Fields.

Himalayan salt lamps, negative ion generators, laptop shielding pads, and EMF blankets may help neutralize positive ions from EMFs.

The Importance of Touch and Purpose

Whether we like to admit it or not, we are a socially dependent species. We need each other to thrive. Bill Von Hippel, a social psychologist, professor, and author of *The Social Leap,* believes that the human brain grew and evolved, not to survive or figure out complex ways of dealing with the environment, but to socially coexist with each other in communities. We can see some of these tendencies now.

There is a reason we care what people think of us and why some of our deepest fears are ultimately about rejection. We are hardwired to care what the collective group thinks and that we are doing and thinking the right things to belong. This is why social media platforms and hashtags have become so powerful in community building. We can easily search for communities that align with our ideals and values.

The United States is an individualistic culture, more focused on the self than the collective community. But we are still dependent on groups. We need each other not only to survive but to thrive. Ironically, when we are unhappy, we tend to isolate, even though that's when we need people the most.

So why do we isolate?

It's a protective mechanism not to feel rejection when we aren't our best selves. In psychotherapy, we learn that we use cognitive distortions for self-preservation. We isolate to protect ourselves from our deepest fears. I use an exercise with some clients to get to the root cause of these fears. It goes a little like this:

Judy: Why did you choose not to go out tonight?

Client: Because I didn't feel good.

Judy: What about not feeling good made you not go?

Client: I didn't want people to see me because I have gained weight.

Judy: Let's say that's true. Let's say they noticed that you gained weight. What then? What happens if they see that you gained weight?

Client: They might think these thoughts of me (judge me), and I'll feel shame.

Judy: Let's say that's true. Let's say they judge you, and you feel shame. Then what happens?

Client: I'll feel like everyone is talking about me and making fun of me.

Judy: Okay, then what? Let's say everyone is talking about you and making fun of you. Then what?

Client: Then, I'll want to leave.

Judy: Why?

Client: Because I'll feel rejected.

Judy: So your deepest fear is that you might be ridiculed and rejected and that you'll be alone. Instead, you decide to reject and isolate yourself not to have to experience these events. Do you know why?

Client: I guess my fear is feeling rejection (not belonging).

This client was practicing self-preservation by subconsciously catering to her biggest fears. Instead of being vulnerable and courting rejection, she subconsciously chose to reject herself first by choosing isolation.

What happens when you are rejected?

You become separate from the collective group, you become isolated, and you don’t belong. This is an innate fear in many humans. You may do this all the time. You blame tiredness, sickness, being busy, and miss out on things. Why?

Figure 18.15. Faulty Thinking and Cognitive Distortions.

Figure 18.15 shows some of the most common faulty thinking and cognitive distortions. Figure out the root cause. Usually, these are the times you need community the most. Find the *right* community.

We've become a society that puts much value on personal space. We can see the difference in cultures just by the distance we stand apart while conversing. But we need human touch.

In fact, studies have shown that babies who are not held and hugged enough can stop growing (this is failure to thrive), and if the situation lasts long enough, they can die. Researchers discovered this when trying to figure out why some orphanages had infant mortality rates of 30 to 40 percent. We now know that orphanages are not suitable places for infants. Newborns and children through the age of five don't receive enough stimulation in group residential care to develop to their full capacity. Without real touch (love and empathy), their ability to survive becomes greatly compromised.[382]

Do you think this human need for touch goes away after age five?

During my time at the University of California, Berkeley, I participated in a graduate study. I sat across from an individual, but because of a physical barrier, I could see only the person's arm. I read several emotions on a card and had to use only my hands to convey each emotion through a one-second touch on the person's forearm. Then the other person had to guess the emotion.

How would you demonstrate sadness? Anger? Love?

In fact, given the range of emotions used in the study, there was only a 9 percent chance someone would guess the right emotion. Remarkably, participants correctly named compassion nearly 60 percent of the time. Gratitude, anger, love, fear—participants got those right more than half the time.[383]

Just by touching a stranger for one second, we were able to guess an emotion correctly. Imagine what emotions we share with our children.

We should eat nutrient-dense foods, but we must also live empathetically connected. This is why, in moments of grief, hugs are incredibly comforting. Touch signals safety and trust. Touch is one of the five love languages, a universal way we give and receive (or communicate) love. Touch provides its own language of compassion, a language that is essential to what it means to be human.[384]

Isolation and lack of physical contact are detrimental to our well-being. That is why the most severe punishment in prison is solitary confinement.

Purpose and Connection

Many studies show the health benefits of being or feeling a part of something bigger than yourself. Many studies show this increases overall happiness and improves mental health.[385] Figure 18.16 depicts how purpose and connection help to support optimal health and well-being.

We need to have a higher purpose for being on this earth. What is your legacy? Having a purpose—for something other than materialistic wealth, family comfort, and the proper upbringing of children—is a significant component of overall health and happiness.

There is no such thing as long-term happiness, but we can achieve moments of happiness, which is much easier when we have a purpose that is greater than ourselves.

I hate talking about money because it causes division and stratifies society. It separates the haves and have-nots. While our happiness suffers when our basic needs are not met (Maslow's hierarchy of

needs: air, food, water, shelter, clothing, sleep), once they are met, even if you make millions of dollars, the incremental increase in happiness is minimal.[386]

I was a management consultant for over a decade. I attained all my materialistic goals, and while these things should have brought me happiness, I was suffering from an eating disorder and barely making it to work to manage my teams. I was sick and depressed, and frankly had many days when I wished I could sleep forever.

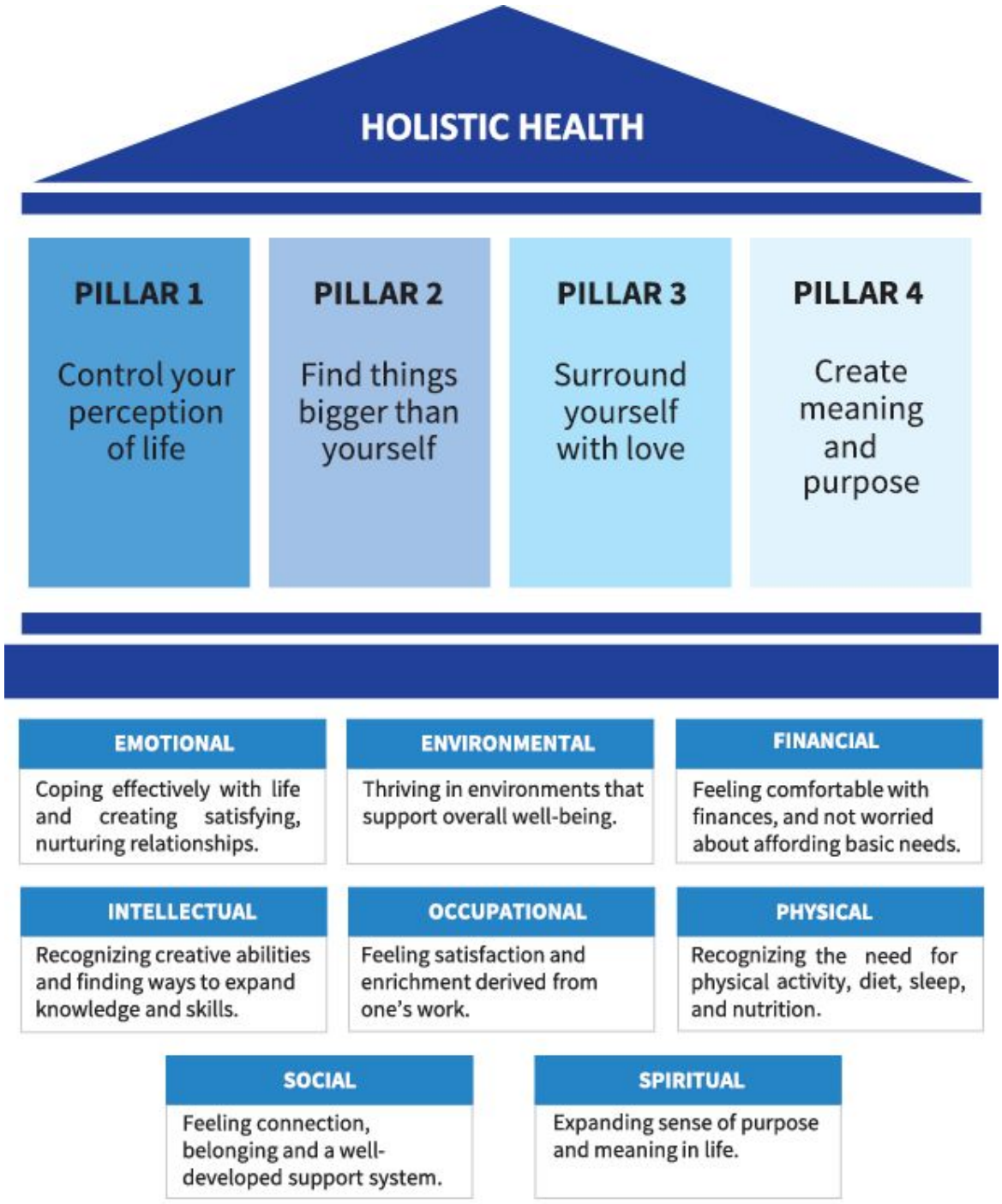


Figure 18.16. Nutrition with Judy's Holistic Health Perspective.

While some thought my jet-setting life (think of 2019's *Up in the Air* with George Clooney) was pretty enviable, I was deeply depressed and, most of all, lonely. When I eventually found my way to evidence-based nutrition, supporting the community, and using my

gifts for a greater good, I found real purpose. Some days are grueling. Some days, I remember the days of easier money. But I know deep down that I'm right where I am supposed to be. I work harder than I ever have, but I have never felt fulfilled and complete as I do now.

Find your purpose. Use your gifts. Share your talents. Your wellness depends on it.

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Chapter 19

Frequently Asked Questions

The best time to plant a tree was 20 years ago. The second best time is now.

— Proverb

1. How do you maneuver eating out?

There are many BBQ restaurants and steak restaurants. I usually ask for the meat by itself and ask for extra butter. I also ask if it's real butter because so many restaurants use margarine or butter-blends. Always ask if it's real butter. You can also bring your own butter and salt. BYO*B* has a new name.

Some people bring their own oils and ask the restaurant to use it during cooking. Nowadays, when I eat out, I sometimes get hives from the inflammatory oils. It's not an indication that my body is less resilient, but that my body is running on whole foods. It now rejects (and lets me know) when I'm eating less than ideal foods.

If our family eats fast food, we order individual beef patties and order enough to make it a meal. Check the restaurant's menu beforehand. If you think the portions are too small, eat beforehand.

2. How do I increase my fat intake?

Consume more butyrate-rich butter, ghee, lard, tallow, suet, bacon fat, cod liver oil, and marrow. You can ask the butcher to trim less of the fat off the meats. Buy the fattiest cuts of ground beef. The most common ratios of protein to fat are 85 percent lean and 15 percent

fat or 80 percent lean and 20 percent fat. There are also cuts of ground beef that are 73 percent lean and 27 percent fat.

Dairy is not the way to increase fat. Dairy will allow you to consume a lot of calories but it also has a significant amount of protein. Pork belly has a significant amount of fat, and bone marrow is nearly all fat.

When you first start Carnivore Cure, you can track your macronutrients on calorie counters, such as MyFitnessPal. Tracking initially can you give you an idea of how much fat you are consuming.

3. How do I navigate social aspects?

Most people are focused on themselves and may not notice you are just eating meat. It's better not to talk about your diet unless you are ready to be bombarded with many questions. People will naturally question you, as it will cause cognitive dissonance in themselves. They have to prove that your way of eating is wrong so that they can continue and justify that their way of eating non-carnivore is fine.

If you aren't ready to deal with this challenge, I'd shy away from talking about your new way of eating.

If people do notice, you can say you have health conditions requiring you to do an elimination diet for healing. Whenever the situation is medically related, people usually leave it alone.

Make sure to find community. Join social media groups and follow meat-focused hashtags. Find support because it's hard to do this alone.

4. How often do you eat?

I started with two meals a day and quickly moved to one meal a day (OMAD). But the amount I was eating was raising my glucose levels (> 115 mg/dL) after eating. My energy was less than ideal, and I started gaining weight. When I shifted to two meals a day, my energy has balanced, and my blood sugars have normalized. Most of my clients consume two to three meals a day.

At least two meals a day is better for digestion and the absorption of nutrients. It also helps normalize the amount you eat in meals. Don't eat OMAD because you don't trust yourself with the portions you'd consume if you have a couple of meals—this is a temporary fix. Heal your relationship with food.

5. Why am I not losing weight?

Sometimes from years of dieting, our metabolic rate has learned to run on a very low caloric number. When you start to eat meat, you may gain weight. Some practitioners believe that the cells hold onto nutrients because they fear starvation from years of dieting. I've yet to find scientific evidence on this, but be patient and heal your body first.

Eat as much meat as you want when you first transition but remember that calories still matter. My general rule of thumb is that everyone should at least consume 16 ounces of protein daily. But don't worry about how much you eat when you first eat meat-based. Once you are in a rhythm, make sure you are eating the right amount of fats and proteins for your body and your level of movement.

Be patient. Give it time. Heal your body first, and then you can use levers like extended fasting, macronutrient changes (higher fat, lower protein), hydration, and cardiovascular exercise to lose weight.

6. Can I gain weight on carnivore?

Make sure to eat a lot of calorically-dense foods. Try to eat multiple times a day. Snacking can help. You need to eat more calories than you burn. Eating more frequently, in this case, will allow you to consume more.

If you only eat fat, you may be satiated longer and will have a difficult time eating again. Find the fat and protein ratios that allow you to eat more.

7. How long does it take to get fat-adapted?

If you are coming from a diet where you are fueling the body on sugar and carbohydrates (over 200 grams of carbohydrates), you will go through a transition period. It takes about two to three days for the glycogen in the liver and muscles to be fully utilized, and your body will start making ketones for energy. The low carb or keto carnivore flu transition will depend on how strict you are in minimizing any exogenous sugars and properly managing your electrolytes. You should feel better in about a week.

To become fat-adapted, where your body is metabolically flexible and able to use both glucose and ketones effectively, can take months. It depends on the condition of the body.

You can take BHBs (exogenous ketones) to support the transition from being a sugar burner to a fat burner. They can give you temporary bouts of energy. Just make sure to find the ones with no added sweeteners.

8. Why is my energy tanking?

The reason is really individual-specific. You need to keep up and manage electrolytes in the beginning. Your kidneys will release a lot of the water that was tied to glycogen, and with the release of water, you are more susceptible to losing critical electrolytes such as

sodium, magnesium, and potassium. If you take an electrolyte supplement, make sure to take one without sweeteners.

Try homemade bone broth (or meat stock if bone broth is too advanced a food for your current gut health) with all its minerals and nutrients.

Sometimes you have dips in energy because you get trace amounts of carbohydrates, and then your body is waiting for more sugars instead of tapping into ketones. Make sure to limit your consumption of deli meat and processed sausages with sugars (dextrose, maltodextrin). The faster you remove sugars, the faster your body is forced to produce ketones.

Sometimes you can be tired because you are consuming too much protein and not enough fat. This is where measuring your glucose and ketone levels on blood monitors are great options. If your glucose levels are high and your ketones have dipped significantly, you likely are consuming too much protein (assuming there was zero sugar in your foods).

Try cutting out some protein and adding more fats. See if this helps. If you are only eating one meal, you may have to break up your meals so you can get sufficient amounts of proteins and fats without overloading the body with too much food in one sitting.

Sometimes the body requires more carnitine when breaking down a lot of proteins (amino acids) and fats. You can take the organic acids test and see where your markers are for B1, B2, B6, B12, and L-Carnitine. You may initially need support to break down amino acids in order to have more energy, especially if you did not eat a lot of meat before starting carnivore.

9. Why do I have loose stools?

Oftentimes we come from a low-fat diet or a diet with lots of fiber and plants that bulk up our stools. With less bulk and more demand on the gallbladder to release bile to break down fats, we can get loose stools. Our gallbladders have to wake up, and the sludgy bile from infrequent use has to clean up so that the process can run smoothly again (literally). Sometimes it's the lowering of insulin, extra fluid, and electrolyte changes that causes runs.

Sometimes its oxalate dumping and other removals of toxins. Now that the detox pathways are clearing up, a lot more toxins will be released from the body. As you don't know for certain, be patient. Give it time, and in the meantime, digestive aids can help with the stools. Toxin-removing immune supplements can also help. If you want my recommended gut healing and carnivore diet transition supplements, you can find them at www.carnivorecure.com/resources.

If you have loose stools after months, you may have some yeast or bacterial overgrowth, and functional tests are key here. You can try to cut down on the fat and consume leaner meats, but this is a temporary fix.

Rendered fat tends to give some individuals loose stools. We should all be able to handle rendered fats. It's not necessarily that you can't digest rendered fats but may need some digestive supports.

There is no such thing as "my body can't handle X amount of fat." If you've been following a carnivore diet for many months, and still have loose stools with higher fat meals, it's a sign that you need to do some gut healing.

10. Why am I constipated?

This oftentimes happens during the transition period, or when you are consuming a lot of processed meats. The number one reason

people have constipation is too lean of meats, too much dairy, or not enough proper hydration. Many times, when you transition to carnivore, you want something to snack on, or something that takes care of the cravability factor. You may turn to cheese and lots of it. Cheese can bypass our satiety mechanisms and then overconsume dairy. Removing dairy, in the beginning, can help fast-track getting adapted to carnivore.

I've seen clients where they eat a lot of deli meats, pork rinds, and sausages and have issues with bowel movements. Limit the processed pork rinds. The flavored ones often use MSG, and most pork rinds are cooked in inflammatory oils. If you want to see my recommended pork rinds and other products, you can find them at www.carnivorecure.com/behavior.

You can always introduce these foods later but don't rely on these foods as your main staples for a carnivore diet. If you are constipated, drink some bone (meat) broth and consume more fat. Also, make sure you are hydrated. Water is life.

11. I don't know how to eat intuitively. My body doesn't know when it's full. Help?

It takes time to get back to mindful eating and practice intuitive eating. Sometimes, especially if you tend to overeat on foods and turn to foods for comfort, it is harder to go back to intuitive eating. You can go to www.carnivorecure.com/behavior and get the intuitive eating worksheet to help support you.

12. Why am I still craving sugar?

After a week or two, physical sugar cravings should subside. If you are still physically craving it after weeks, I'd look into the foods you are consuming. Do they have sugars? Sweeteners?

Mentally craving sugar is a much longer journey. You may turn to food for many reasons, and oftentimes, these emotional moments make us crave carbohydrates. Stress is a big trigger for old habits. You need to reroute the brain to find new habits. Extinguish the cravings and neural pathways that make you turn to sugar. Work on new habits to use when stress and emotional moments happen. Sugar is never the answer.

13. What can I snack on?

Ideally, if you are eating nutrient-dense meals, you do not need to snack. I try to have my clients stop snacking, and instead, eat sufficient calories during their meals.

If you want to snack, sausages, jerkies, pork rinds, butter, cheese, and eggs are all options. If you want to see my recommended snack list, you can find them at www.carnivorecure.com/resources.

14. Why is my sleep getting worse?

I use a topical magnesium spray as magnesium is best absorbed through the skin. I would try all the basic habits of getting better sleep (e.g., blue light blockers, cool room, meditation, etc.) and lowering lifestyle stressors.

If electrolytes aren't helping with sleep, it may be the adrenals. The stress response, cortisol, wakes us up at night to better manage our blood sugars. When we are stressed, our bodies will have more imbalances with cortisol. This is where managing stress is key.

Additionally, being in ketosis may cause you to have more energy, and if you don't release the energy, you can have trouble sleeping. This is where exercise is vital. Release that energy.

Many carnivores also require less sleep than before to feel rejuvenated. If you feel rested, don't worry about always needing

eight hours.

15. I have leg cramps in the middle of the night

I recommend topical magnesium spray for leg cramps if salt intake is sufficient throughout the day. As discussed, magnesium helps the muscles to relax. Spray the calves before bed and see if it helps. It's difficult to overdose on topical magnesium. Visit www.carnivorecure.com/resources for my recommended magnesium spray.

If it doesn't help, try exercising at least 30 minutes in the day.

There are anecdotal stories that some individuals have to introduce carbohydrates at the end of the night in order to remove leg cramps and sleep better. I haven't worked with any clients that had to do this, but it's something to consider as a last resort option.

16. Can I use seasonings?

This is very individualized. Read the seasoning section in Chapter 6. Make sure to pick seasonings with the least amount of antinutrients and, ideally, are organic and locally sourced, and from a trusted source.

If you used to eat every single color and food type, then you may feel bored on a meat-based diet. Each day, more creative carnivore recipes come out in carnivore cookbooks and on blog posts. The #Carnivore75Hard community has a free community recipe book. You can get the free community recipe cookbook at www.carnivorecure.com/resources. There is a KFC Carnivore version, cheese-based waffles (chaffles) and other carnivore-friendly foods.

The longer you follow a carnivore diet, you tend to choose simplicity. It's something that is only experienced after doing it yourself.

17. Can you gain muscle?

Yes, there are many stories of carnivores gaining mass. Protein helps build muscle, and fat will help boost hormones, including testosterone. Make sure to eat a sufficient number of calories and protein for lean body mass.

18. Why did I lose my menstruation cycle?

You may be undereating or over-exercising. You can review the endocrine section (Chapter 12) for more information. Make sure you have enough nutrients to support the adrenals and hormones. It is rare to lose your period because of fasting. But being underweight, having poor adrenal health, overexercising, and undereating can cause amenorrhea.

19. Can I eat meat-based without a gallbladder?

In a perfectly healthy body, you should not be removing any body parts. But yes, your liver still creates bile. You just don't have an extra storage place for bile, but your body can adapt to a higher fat diet and thrive. You may need some gallbladder support to help break down fat initially, but the body is a wonderful machine that will find a new balance with fattier cuts of meat.

20. Can I afford to eat only meat?

Without all the garnishes, sides, snacks, and everything in between, this way of eating is typically cheaper. Find meats on sale at the local grocery stores. Look for deals. Buy in bulk.

Join a cow-share. Find a local farmer and buy a quarter, half or full steer. These grass-fed, grass-finished steers are more economical than buying all your meat at the grocery store. In Austin, Texas, we pay about $6-7 per pound when buying a quarter or half a grass-

finished steer. Sometimes bones and organ meat come as a free bonus, or they are discounted heavily.

If you choose to eat grass-fed ribeyes each meal for every meal, then yes, it will get expensive. But if you eat a blend of grass-fed, conventional, and a variety of meats, the price is very affordable.

If you only want to eat grass-fed ribeyes, you can essentially do longer fasts and eat ribeyes during your eating windows.

When there’s a will, there’s a way.

21. What about alcohol?

Your body will first process the alcohol before sugars, proteins, and fat. Many carnivore dieters end up becoming intoxicated faster than when they used to eat carbohydrates. Take it slowly.

There are alcohols that are zero carbohydrates. Limit alcohol with any grains and hops. Both are high in antinutrients and affect the endocrine system. Alcohol is not ideal, but life is about balance. Figure the balance that best fits your life.

Chapter 20

Sample Meal Plan and Animal Nutrition

Figure 20.1 is the Carnivore Cure food pyramid once you complete the elimination protocol (successful completion of Carnivore Cure week 4). Table 20.2 is a summary of the Carnivore Cure elimination and reintroduction protocol.

Tables 20.3 – 20.6 are sample meal plans for a person at maintenance weight. Recall the minimums and ideals for protein consumption in Chapter 14. You do not want to undereat protein long-term as you can lose lean body mass. Remember, Carnivore Cure is not a fad, weight loss diet. The elimination diet is focused on healing and optimizing energy levels by personalizing macronutrient profiles. Weight loss can come later.

The sample meal plans include week one and week four of the Carnivore Cure protocol. Remember, week one is the most restrictive dietary plan and week four has more variety in meats and eggs. Make sure to take the proper steps before skipping to week four. The sample meal plans are for a 150-pound person (68 kg) eating a high-fat version of Carnivore Cure.

Table 20.3 shows an 80-percent fat macronutrient profile and Table 20.4 shows the same foods with a 70-percent fat macronutrient profile. The protein amounts stay relatively the same. The goal of these tables is to show you the difference in fat amounts when eating a high-fat (ketogenic or therapeutic) version of carnivore. One thing to note is that if you keep the protein the same at 80-percent

fat, the calories do increase significantly. This is where moderating your protein may become essential, but lowering to less than 0.8 grams (0.5 kg) of protein per 1 pound of maintenance weight is not recommended overtime. You need lean body mass for longevity.

Tables 20.5 and 20.6 follow the same structure but with a variety of meats. If you gain weight, you do not want to cut fat first as your hormone health, brain health and every single cell in your body may suffer. Find the personalized fat macronutrient profile that can help you feel energized and give you optimal health.

Tables 20.7 – 20.10 share various meats and their nutrient profiles per the USDA's food nutrient database. You can access the full Carnivore Cure food list at www.carnivorecure.com/protocol. These next few tables should provide you the assurance that animal-based foods are, in fact, nutrient-dense and that they must take priority for optimal health.

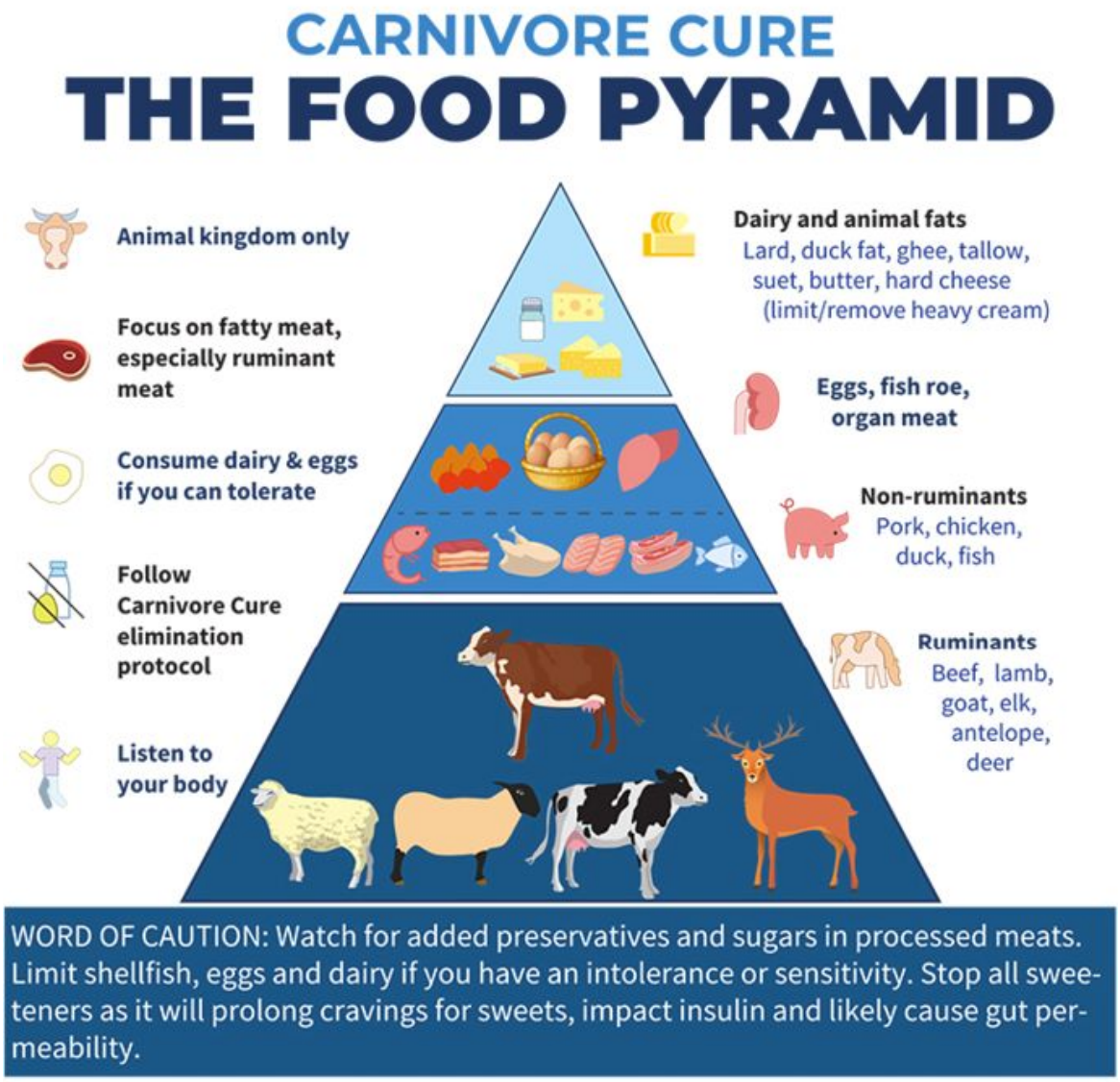

Figure 20.1. Carnivore Cure's Food Pyramid.

CARNIVORE CURE ELIMINATION AND REINTRODUCTION PROTOCOL SUMMARY

By following the Carnivore Cure elimination and reintroduction protocol, you will safely identify culprit foods and food sensitivities. If a food causes a symptom, remove it immediately. Wait until symptoms completely disappear before trying another culprit food.

- If you find a food sensitivity, you can always reintroduce the food again later as your gut heals and the body becomes stronger.
- Skin sensitivities and symptoms like eczema and psoriasis can take the longest to heal.
- The more you patiently reintroduce foods (give sufficient time per food), the better your results in finding your own ideal list of foods for optimal health.

Note: Days 1–40 are representative examples. Depending on your symptoms and response to foods, your time to complete the elimination and reintroduction protocol will vary.

ELIMINATION PROTOCOL

• Elimination	• *Day 1* • *Day 2-7* • *Day 8 -30*	• Begin elimination protocol. • Symptoms may worsen. • Symptoms should go away if the right foods have been removed. If not, continue elimination protocol until symptoms cease.

REINTRODUCTION CHALLENGE

• Reintroduction	• *Day 31*	• Begin reintroduction. Start with animal-based foods you couldn't tolerate.
	• *Day 32*	• If no symptoms occur, eat twice the amount of the culprit/challenge food as day 31.
	• *Day 33*	• If no symptoms occur, eat twice the amount of the culprit/challenge food as day 32.
	• *Day 34-35*	• Continue to incorporate culprit/challenge foods in isolation—without any other new foods.

REINTRODUCTION CHALLENGE, CONTINUED

• Reintroduction, continued	• *Day 36-40*	• If no symptoms occur with previous culprit/challenge foods, keep the food in protocol. • Start with a new food item (e.g., animal food or safest plant food). • Follow the steps of Day 31-35. • Continue the reintroduction protocol for all new foods you wish to reintroduce.

Table 20.2. Carnivore Cure Elimination and Reintroduction Protocol Summary.

CARNIVORE CURE WEEK ONE PROTOCOL

WEEK ONE MEATS, 150 G PROTEIN, 80% FAT, 20% PROTEIN

Carnivore Cure does not prioritize calories. The focus is on healing and optimizing energy levels by personalizing macronutrient profiles. Reference Chapter 14 for protein and fat minimums. This sample meal plan is for a 150 lb. person (68 kg). If you are gaining weight, you can reduce your protein intake to 0.8 g per lb. (0.5 kg) of maintenance weight. Don't just cut fat as it can have adverse effects on hormones and every cell in the body. If you choose two meals a day, make sure to eat enough protein.

80%/20% MEAL PLAN	BREAKFAST	LUNCH	DINNER
DAY 1 79.2% fat	**FRESH BEEF PATTIES*** • 80% lean, 20% fat • precooked: 6 oz (170 g) **FAT** • 4 Tbsp (60 g)	**BEEF OR LAMB RIBEYE** • precooked: 12 oz (340 g) **FAT** • 4 Tbsp (60 g)	**LAMB MEAT** • precooked: 12 oz (340 g) **FAT** • 3 Tbsp (45 g)
DAY 2 79.8% fat	**FRESH GROUND BEEF*** • 80% lean, 20% fat • precooked: 6 oz (170 g) **FAT** • 4 Tbsp (60g)	**CHUCK STEAK** • precooked: 11 oz (312 g) **FAT** • 3 Tbsp (45 g)	**RIBEYE** • precooked: 12 oz (340 g) **FAT** • 2 Tbsp (30 g)
DAY 3 79.3% fat	**FRESH GROUND CHUCK*** • 80% lean, 20% fat • precooked: 6 oz (170 g) **FAT** • 4 Tbsp (60 g)	**RIBEYE** • precooked: 12 oz (340 g) **FAT** • 2 Tbsp (30 g)	**RIBEYE** • precooked: 12 oz (340 g) **FAT** • 2 Tbsp (30 g)
DAY 4 79.6% fat	**RIBEYE** • precooked 6 oz (170 g) **FAT** • 4 Tbsp (60 g)	**RIBEYE** • precooked: 12 oz (340 g) **FAT** • 3 Tbsp (45 g)	**RIBEYE** • precooked: 10 oz (284 g) **FAT** • 2 Tbsp (30 g)
DAY 5 79.5% fat	**FRESH GROUND LAMB*** • 80% lean, 20% fat • precooked: 5 oz (142 g) **FAT** • 3 Tbsp (45 g)	**NEW YORK STRIP** • precooked: 10 oz (284 g) **FAT** • 4 Tbsp (60 g)	**RIBEYE** • precooked: 13 oz (369 g) **FAT** • 3 Tbsp (45 g)
DAY 6 79.3% fat	**FRESH GROUND CHUCK*** • 80% lean, 20% fat • precooked: 5 oz (142 g) **FAT** • 3 Tbsp (45 g)	**T-BONE STEAK** • precooked: 10 oz (284 g) **FAT** • 3 Tbsp (45 g)	**LAMB SHOULDER** • precooked: 10 oz (284 g) **FAT** • 3 Tbsp (45 g)
DAY 7 79.2% fat	**FRESH GROUND LAMB*** • 80% lean, 20% fat • precooked: 6 oz (170 g) **FAT** • 3 Tbsp (45 g)	**CHUCK STEAK** • precooked: 12 oz (340 g) **FAT** • 3 Tbsp (45 g)	**BEEF SHORT RIBS** • precooked: 12 oz (340 g) **FAT** • 2 Tbsp (30 g)

* During Carnivore Cure week one, eat only fresh meats that are ground from your butcher. (Unless you know you can tolerate packaged, store-bought ground meats.)

Table 20.3. Carnivore Cure Week One Protocol 80%/20%.

CARNIVORE CURE WEEK ONE PROTOCOL

WEEK ONE MEATS, 150 G PROTEIN, 70% FAT, 30% PROTEIN

Carnivore Cure does not prioritize calories. The focus is on healing and optimizing energy levels by personalizing macronutrient profiles. Reference Chapter 14 for protein and fat minimums. This sample meal plan is for a 150 lb. person (68 kg), eating less fat than 80% but still eating a high fat diet. If you are gaining weight, this may help. You can also try to reduce your protein intake to 0.8 g per lb. (0.5 kg) of maintenance weight. Trust the body.

70%/30% MEAL PLAN	BREAKFAST	LUNCH	DINNER
DAY 1 71.2% fat	**FRESH BEEF PATTIES*** • 80% lean, 20% fat • precooked: 6 oz (170 g) **FAT** • 1 Tbsp (15 g)	**BEEF OR LAMB RIBEYE** • precooked: 12 oz (340 g) **FAT** • 1 Tbsp (15 g)	**LAMB MEAT** • precooked: 12 oz (340 g) **FAT** • No added fat
DAY 2 70.1% fat	**FRESH GROUND BEEF*** • 80% lean, 20% fat • precooked: 6 oz (170 g) **FAT** • No added fat	**CHUCK STEAK** • precooked: 11 oz (312 g) **FAT** • No added fat	**RIBEYE, BONE-IN** • precooked: 12 oz (340 g) **FAT** • No added fat
DAY 3 71.2% fat	**FRESH GROUND CHUCK*** • 80% lean, 20% fat • precooked: 6 oz (170 g) **FAT** • No added fat	**RIBEYE, BONE-IN** • precooked: 12 oz (340 g) **FAT** • No added fat	**RIBEYE, BONE-IN** • precooked: 12 oz (340 g) **FAT** • No added fat
DAY 4 71.2% fat	**RIBEYE, BONE-IN** • precooked 6 oz (170 g) **FAT** • No added fat	**RIBEYE, BONE-IN** • precooked: 12 oz (340 g) **FAT** • No added fat	**RIBEYE, BONE-IN** • precooked: 10 oz (284 g) **FAT** • No added fat
DAY 5 70.2% fat	**FRESH GROUND LAMB*** • 80% lean, 20% fat • precooked: 5 oz (142 g) **FAT** • No added fat	**NEW YORK STRIP** • precooked: 10 oz (284 g) **FAT** • 1 Tbsp (15 g)	**RIBEYE, BONE-IN** • precooked: 13 oz (369 g) **FAT** • No added fat
DAY 6 70.2% fat	**FRESH GROUND CHUCK*** • 80% lean, 20% fat • precooked: 5 oz (142 g) **FAT** • 1 Tbsp (15 g)	**T-BONE STEAK** • precooked: 10 oz (284 g) **FAT** • No added fat	**LAMB SHOULDER** • precooked: 10 oz (284 g) **FAT** • No added fat
DAY 7 72.6% fat	**FRESH GROUND LAMB*** • 80% lean, 20% fat • precooked: 6 oz (170 g) **FAT** • No added fat	**CHUCK STEAK** • precooked: 12 oz (340 g) **FAT** • No added fat	**BEEF SHORT RIBS** • precooked: 12 oz (340 g) **FAT** • No added fat

* During Carnivore Cure week one, eat only fresh meats that are ground from your butcher. (Unless you know you can tolerate packaged, store-bought ground meats)

CARNIVORE CURE WEEK FOUR PROTOCOL
WEEK FOUR MEATS, 150 G PROTEIN, 80% FAT, 20% PROTEIN

Carnivore Cure does not prioritize calories. The focus is on healing and optimizing energy levels by personalizing macronutrient profiles. Reference Chapter 14 for protein and fat minimums. This sample meal plan includes week four meats (for more variety) and is for a 150 lb. person (68 kg). If you are gaining weight, you can reduce your protein intake to 0.8 g per lb. (0.5 kg) of maintenance weight. If you choose two meals a day, make sure to eat enough protein.

80%/20% MEAL PLAN	BREAKFAST	LUNCH	DINNER
DAY 1 80.0% fat	**FRESH BEEF PATTIES*** • 80% lean, 20% fat • precooked: 6 oz (170 g) **FAT** • 3 Tbsp (45 g)	**BEEF OR LAMB RIBEYE** • precooked: 12 oz (340 g) **FAT** • 3 Tbsp (45 g)	**RIBEYE, BONE-IN** • precooked: 10 oz (284 g) **FAT** • 3 Tbsp (45 g)
DAY 2 80.0% fat	**FRESH GROUND BEEF*** • 80% lean, 20% fat • precooked: 6 oz (170 g) **FAT** • 3 Tbsp (45 g)	**CHICKEN THIGHS** • precooked: 12 oz (340 g) **FAT** • 4 Tbsp (60 g)	**CHUCK STEAK** • precooked: 12 oz (340 g) **FAT** • 4 Tbsp (60 g)
DAY 3 79.6% fat	**BACON AND EGG YOLKS** • precooked: 8 pieces • 5 egg yolks **FAT** • 6 Tbsp (90 g)	**PORK CHOPS** • precooked: 10 oz (284 g) **FAT** • 5 Tbsp (75 g)	**RIBEYE, BONE-IN** • precooked: 12 oz (340 g) **FAT** • 5 Tbsp (75 g)
DAY 4 79.5% fat	**RIBEYE, BONE-IN** (71% fat) • precooked 6 oz (170 g) **FAT** • 7 Tbsp (105 g)	**CHICKEN WINGS** (60% fat) • precooked: 8 wings **FAT** • 8 Tbsp (125 g)	**NEW YORK STRIP** (60% fat) • precooked: 9 oz (255 g) **FAT** • 6 Tbsp (90 g)
DAY 5 80.2% fat	**EGG YOLKS AND BACON** • 5 egg yolks • 2 bacon **FAT** • 3 Tbsp (45 g)	**CHUCK STEAK** • precooked: 10 oz (284 g) **FAT** • 3 Tbsp (45 g)	**CHICKEN THIGHS** • precooked: 10 oz (284 g) **FAT** • 3 Tbsp (45 g)
DAY 6 79.2% fat	**FRESH GROUND LAMB*** • 80% lean, 20% fat • precooked: 5 oz (142 g) **FAT** • 4 Tbsp (60g)	**SALMON** • precooked: 10 oz (284 g) **FAT** • 4 Tbsp (60 g)	**LAMB SHOULDER** • precooked: 7 oz (198 g) **FAT** • 3 Tbsp (45 g)
DAY 7 80.2% fat	**FRESH GROUND LAMB*** • 80% lean, 20% fat • precooked: 6 oz (170 g) **FAT** • 3 Tbsp (45 g)	**CHUCK STEAK** • precooked: 10 oz (284 g) **FAT** • 3 Tbsp (45 g)	**PORK BELLY** • precooked: 12 oz (340 g) **FAT** • 3 Tbsp (45 g)

* During Carnivore Cure week four, eat only fresh meats that are ground from your butcher. (Unless you know you can tolerate packaged, store-bought ground meats.)

Table 20.5. Carnivore Cure Week Four Protocol 80%/20%.

CARNIVORE CURE WEEK FOUR PROTOCOL

WEEK FOUR MEATS, 150 G PROTEIN, 70% FAT, 30% PROTEIN

Carnivore Cure does not prioritize calories. The focus is on healing and optimizing energy levels by personalizing macronutrient profiles. Reference Chapter 14 for protein and fat minimums. This sample meal plan includes week four meats (for more variety) and is for a 150 lb. person (68 kg) eating less fat than 80% but still following a high fat diet. If you are gaining weight, this may help. You can also try to reduce your protein intake to 0.8 g per lb. (0.5 kg) of maintenance weight. Trust the body.

70%/30% MEAL PLAN	BREAKFAST	LUNCH	DINNER
DAY 1 71.1% fat	**FRESH BEEF PATTIES*** • 80% lean, 20% fat • precooked: 6 oz (170 g) **FAT** • No added fat	**BEEF OR LAMB RIBEYE** • precooked: 12 oz (340 g) **FAT** • No added fat	**RIBEYE, BONE-IN** • precooked: 10 oz (284 g) **FAT** • No added fat
DAY 2 71.5% fat	**FRESH GROUND BEEF*** • 80% lean, 20% fat • precooked: 6 oz (170 g) **FAT** • No added fat	**CHICKEN THIGHS** • precooked: 12 oz (340 g) **FAT** • 1 Tbsp (15 g)	**CHUCK STEAK** • precooked: 12 oz (340 g) **FAT** • 1 Tbsp (15 g)
DAY 3 70.6% fat	**BACON AND EGG YOLKS** • precooked: 8 pieces • 6 egg yolks **FAT** • 2 Tbsp (30 g)	**PORK CHOPS** • precooked: 10 oz (284 g) **FAT** • 2 Tbsp (30 g)	**RIBEYE, BONE-IN** • precooked: 12 oz (340 g) **FAT** • 1 Tbsp (15 g)
DAY 4 70.1% fat	**RIBEYE AND BACON** • precooked 4 oz (113 g) • 2 bacon pieces **FAT** • 2 Tbsp (30 g)	**CHICKEN WINGS** • precooked: 8 wings **FAT** • 4 Tbsp (60 g)	**NEW YORK STRIP** • precooked: 9 oz (255 g) **FAT** • 1 Tbsp (15 g)
DAY 5 71.1% fat	**EGG YOLKS** • 5 egg yolks **FAT** • 1 Tbsp (15 g)	**CHUCK STEAK** • precooked: 10 oz (284 g) **FAT** • No added fat	**CHICKEN THIGHS** • precooked: 12 oz (340 g) **FAT** • No added fat
DAY 6 70.0% fat	**FRESH GROUND LAMB*** • 80% lean, 20% fat • precooked: 5 oz (142 g) **FAT** • No added fat	**SALMON** • precooked: 10 oz (284 g) **FAT** • 2 Tbsp (30 g)	**LAMB SHOULDER** • precooked: 10 oz (284g) **FAT** • 1 Tbsp (15 g)
DAY 7 72.6% fat	**FRESH GROUND LAMB*** • 80% lean, 20% fat • precooked: 6 oz (170 g) **FAT** • No added fat	**CHUCK STEAK** • precooked: 10 oz (284 g) **FAT** • No added fat	**PORK BELLY** • precooked: 12 oz (340 g) **FAT** • No added fat

* During Carnivore Cure week four, eat only fresh meats that are ground from your butcher. (Unless you know you can tolerate packaged, store-bought ground meats.)

MEATS, FATS AND MINERALS
100 GRAM SERVING

All foods shown are raw (USDA) *Daily values (DV) are shown for Adults and children ≥ age 4.* ~ no information provided	Calories	Carbohydrate (g)	Saturated fat (g)	Mono-unsaturated (g)	Omega-3 (mg)	Omega-6 (mg)	Calcium 1300 mg DV	Copper 0.9 mg DV	Iron 18 mg DV	Magnesium 420 mg DV	Manganese 2.3 mg DV	Phosphorous 1,250 mg DV	Potassium 4700 mg DV	Selenium 55 mcg DV	Zinc 11 mg DV
• Beef, chuck roast	244	0	7.3	7.7	215	440	17	0.1	1.7	19	0	174	290	20.3	4.5
• Beef, ground 85%/15%	215	0	5.9	6.6	42	354	15	0.1	2.1	18	0	171	295	15.8	4.5
• Beef, grass-fed ground	192	0	5.3	4.8	88	427	12	0.1	2	19	0	175	289	14.2	4.5
• Beef heart	112	0	1.4	1.1	11	407	7	0.4	4.3	21	0	212	287	21.8	1.7
• Beef liver	135	3.9	1.2	0.5	7	318	5	9.8	4.9	18	0.3	387	313	39.7	4
• Beef ribeye	274	0	9	9.6	240	510	6	0.1	2.6	24	0	210	357	25.5	7.8
• Beef short ribs	388	0	15.8	16.4	480	810	9	0.1	1.5	14	0	137	232	14.2	3.2
• Beef suet	854	0	52.3	31.5	860	2150	2	0	0.2	1	0	15	16	0.2	0.2
• Beef tallow	902	0	49.8	41.8	600	3100	0	0	0	0	~	0	0	0.2	0
• Beef tongue	224	3.7	7	7.2	~	580	6	0.2	3	16	0	133	315	9.4	2.9
• Bison, grass-fed ground	146	0.1	2.9	2.8	38	261	11	0.1	2.8	21	~	194	328	20	4.6
• Chicken liver	116	0	1.6	1.2	6	486	8	0.5	9	19	0.3	297	230	54.6	2.7
• Chicken, dark meat	113	0	0.9	1.1	90	690	9	0.1	1.2	21	0	178	227	13.5	1.7
• Chicken, light meat	109	0	0.4	0.5	40	240	11	0	0.9	25	0	223	252	17.8	0.7
• Deer, ground	157	0	3.4	1.3	104	225	11	0.1	2.9	21	0	201	330	10	4.2
• Duck, meat, skin	404	0	13.2	18.7	390	4691	11	0.2	2.4	15	0	139	209	12.4	1.4
• Duck fat	882	0	33.2	49.3	1000	11999	0	0	0	0	~	0	0	0.2	0
• Elk	111	0	0.5	0.4	40	170	4	0.1	2.8	23	0	161	312	9.8	2.4
• Frog legs	73	0	0.1	0.1	51	20	18	0.3	1.5	20	~	147	285	14.1	1
• Lamb chops	208	0	6.9	5.9	179	377	14	0.1	1.2	18	0.01	149	262	4.4	2.1
• Lard	902	0	39.2	45.1	1000	10199	0	0	0	0	0	0	0	0.2	0.1
• Pork, ground	263	0	7.9	9.4	70	1670	14	0	0.9	19	0	175	287	24.6	2.2
• Pork bacon	458	0.7	15	20	213	4497	6	0.1	0.5	12	0	188	208	20.2	1.2
• Pork belly	410	0	19.3	24.7	480	5029	5	0.1	2.6	24	0.01	210	357	25.5	7.8
• Pork liver	134	2.5	1.2	0.5	80	350	9	0.7	23.3	18	0.3	288	273	52.7	23.3
• Pork ribs	189	0	4.2	5	63	1391	22	0.1	0.9	21	0	193	318	32.3	2.8
• Turkey liver	228	2.3	5.5	7.4	44	1280	5	0.4	12	15	0.2	279	255	70.8	2.3
• Turkey, meat, skin	129	0	1.4	1.5	90	1080	14	0.2	1.6	20	0	163	232	27.3	2.5

Table 20.7. Meats, Fats and Minerals. USDA.

MEATS AND VITAMINS
100 GRAM SERVING

All foods shown are raw (USDA)
Daily values (DV) are shown for Adults and children ≥ age 4.
~ no information provided

	Vitamin A 900 mcg DV	**Vitamin C** 90 mg DV	**Vitamin D** 20 mcg DV	**Vitamin E** 15 mg DV	**Vitamin K** 120 mcg	**B1 Thiamine** 1.2 mg DV	**B2 Riboflavin** 1.3 mg DV	**B3 Niacin** 16 mg DV	**B5 Pantothenic Acid** 5 mg DV	**B6 Pyridoxine** 1.7 mg DV	**B9 Folate** 400 mcg DV	**B12 Cobalamin** 2.4 mcg DV	**Choline** 550 mg DV
• Beef, chuck roast	1	0	~	0.4	1.6	0.1	0.1	4.3	0.6	0.5	10	1.7	80.3
• Beef, ground 85%/15%	1	0	~	0.4	1.3	0	0.2	4.6	0.5	0.3	6	2.2	61.2
• Beef, grass-fed ground	1	0	~	0.4	1.1	0	0.2	4.8	0.6	0.4	6	2	67.4
• Beef heart	0	2	~	0.2	0	0.2	0.9	7.5	1.8	0.3	3	8.5	~
• Beef liver	4968	1.3	16	0.4	3.1	0.2	2.8	13.2	7.2	1.1	290	59.3	333
• Beef ribeye	2	0	0.1	0.2	1.5	0.1	0.2	3.5	0.7	0.4	3	3.2	74.9
• Beef short ribs	2	0	~	~	~	0.1	0.1	2.6	0.2	0.3	5	2.6	~
• Beef suet	0	0	~	1.5	3.6	0	0	0.3	0	0	1	0.3	5.6
• Beef tallow	0	0	~	2.7	0	0	0	0	0	0	0	0	79.8
• Beef tongue	0	3.1	~	~	~	0.1	0.3	4.2	0.7	0.3	7	3.8	~
• Bison, grass-fed ground	0	0	~	0.2	1.2	0.1	0.2	5.3	~	0.4	12	1.9	85.8
• Chicken liver	3296	17.9	~	0.7	0	0.3	1.8	9.7	6.2	0.9	588	16.6	194
• Chicken, dark meat	18	0.2	0.1	0.2	2.4	0.1	0.2	5.9	1.2	0.3	9	0.3	80
• Chicken, light meat	8	0	~	0.2	2.4	0.1	0.1	10.2	0.9	0.5	4	0.4	~
• Deer, ground	0	0	~	0.5	1.2	0.5	0.3	5.7	0.7	0.5	4	1.9	87.9
• Duck, meat, skin	50	2.8	~	0.7	5.5	0.2	0.2	3.9	1	0.2	13	0.3	31
• Duck fat	0	0	~	2.7	0	0	0	0	0	0	0	0	122
• Frog legs	15	0	~	1	0.1	0.1	0.3	1.2	~	0.1	15	0.4	65
• Lamb chops	16	~	0.1	0.5	3.3	0.1	0.4	11.6	0.4	0.1	32	1.5	120.4
• Lard	0	0	0	0.6	0	0	0	0	0	0	0	0	49.7
• Pork, ground	2	0.7	~	~	~	0.7	0.2	4.3	0.7	0.4	5	0.7	~
• Pork bacon	11	0	~	0.3	0	0.3	0.2	3.8	0.5	0.2	2	0.7	46.6
• Pork belly	3	0.3	1.7	0.7	~	0.4	0.2	4.6	0.3	0.1	1	0.8	55
• Pork liver	6503	25.3	~	~	~	0.3	3	15.3	6.6	0.7	212	26	~
• Pork ribs	2	0	~	0.2	0	0.4	0.3	3.1	1.6	0.5	0	1	81.4
• Turkey, dark meat	1	0	~	~	~	0	0.2	2.8	1.1	0.3	10	0.4	~
• Turkey liver	21704	24.5	~	0.1	0.8	0.2	2.6	13.5	6.3	1.5	677	49.4	222

Table 20.8. Meats and Vitamins. USDA.

SEAFOOD, FATS AND MINERALS
100 GRAM SERVING

All foods shown are raw (USDA) *Daily values (DV) are shown for Adults and children ≥ age 4.* ~ no information provided	**Calories**	**Carbohydrate** (g)	**Saturated fat** (g)	**Mono-unsaturated** (g)	**Omega-3** (mg)	**Omega-6** (mg)	**Calcium** 1300 mg DV	**Copper** 0.9 mg DV	**Iron** 18 mg DV	**Magnesium** 420 mg DV	**Manganese** 2.3 mg DV	**Phosphorous** 1,250 mg DV	**Potassium** 4700 mg DV	**Selenium** 55 mcg DV	**Zinc** 11 mg DV
• Abalone	105	6	0.1	0.1	90	7	31	0.2	3.2	48	0	190	250	44.8	0.8
• Anchovy, canned	210	0	2.2	3.8	2113	362	232	0.3	4.6	69	0.1	252	544	68.1	2.4
• Caviar	252	4	4.1	4.6	6789	81	275	0.1	11.9	300	0.1	356	181	65.5	0.9
• Clam	74	2.6	0.1	0.1	198	16	46	0.3	14	9	0.5	169	314	24.3	1.4
• Cod	82	0	0.1	0.1	221	6	16	0	0.4	32	0	203	413	33.1	0.5
• Crab, Alaskan King	84	0	0.1	0.1	~	~	46	0.9	0.6	49	0	219	204	36.4	5.9
• Crab, Dungeness	86	0.7	0.1	0.2	317	~	46	0.7	0.4	45	0.1	182	354	37.1	4.3
• Eel	184	0	2.4	7.2	653	196	20	0	0.5	20	0	216	272	6.5	1.6
• Halibut	110	0	0.3	0.7	522	30	47	0	0.8	83	0	222	450	36.5	0.4
• Herring	158	0	2	3.7	1729	130	57	0.1	1.1	32	0	236	327	36.5	1
• Lobster	90	0.5	0.2	0.3	~	~	48	1.7	0.3	27	0.1	144	275	41.4	3
• Mackerel, King	105	0	0.4	0.8	330	40	31	0	1.8	32	0	248	435	36.5	0.6
• Mollusks	86	3.7	0.4	0.5	483	18	26	0.1	3.9	34	3.4	197	320	44.8	1.6
• Octopus	82	2.2	0.2	0.2	163	9	53	0.4	5.3	30	0	186	350	44.8	1.7
• Oyster, Eastern, wild	68	3.9	0.8	0.3	672	58	45	4.5	6.7	47	0.4	135	156	63.7	90.8
• Oyster, Pacific	81	4.9	0.5	0.4	740	32	8	1.6	5.1	22	0.6	162	168	77	16.6
• Roe	143	1.5	1.5	1.7	2434	29	22	0.1	0.6	20	0	402	221	40.3	91
• Salmon, Coho, farmed	160	0	1.8	3.3	1281	349	12	0	0.3	31	0	292	450	12.6	0.4
• Salmon, Coho, wild	146	0	1.3	2.1	1474	206	36	0.1	0.6	31	0	262	423	36.5	0.4
• Sardine	208	0	1.5	3.9	1480	3544	382	0.2	2.9	39	0.1	490	397	52.7	1.3
• Scallop	88	2.4	0.1	0	215	4	24	0.1	0.3	56	0.1	219	322	22.2	0.9
• Shrimp	106	0.9	0.3	0.3	540	28	52	0.3	2.4	37	0.1	205	185	38	1.1
• Tilapia	96	0	0.8	0.7	220	210	10	0.1	0.6	27	0	170	302	41.8	0.3
• Tuna, canned, light	116	0	0.2	0.2	279	9	11	0.1	1.5	27	0	163	237	80.4	0.8
• Tuna, canned, white	128	0	0.8	0.8	951	55	14	0	1	33	0	217	237	65.7	0.5
• Tuna, yellowfish	108	0	0.2	0.2	243	8	16	0.1	0.7	50	0	191	444	36.5	0.5

Table 20.9. Seafood, Fats and Minerals. USDA.

SEAFOOD AND VITAMINS
100 GRAM SERVING

All foods shown are raw (USDA) *Daily values (DV) are shown for Adults and children ≥ age 4.* ~ no information provided	**Vitamin A** 900 mcg DV	**Vitamin C** 90 mg DV	**Vitamin D** 20 mcg DV	**Vitamin E** 15 mg DV	**Vitamin K** 120 mcg	**B1 Thiamine** 1.2 mg DV	**B2 Riboflavin** 1.3 mg DV	**B3 Niacin** 16 mg DV	**B5 Pantothenic Acid** 5 mg DV	**B6 Pyridoxine** 1.7 mg DV	**B9 Folate** 400 mcg DV	**B12 Cobalamin** 2.4 mcg DV	**Choline** 550 mg DV
• Abalone	2	2	~	4	23	0.2	0.1	1.5	3	0.2	5	0.7	65
• Anchovy, canned	12	0	~	3.3	12.1	0.1	0.4	19.9	0.9	0.2	13	0.9	85
• Caviar	271	0	232	1.9	0.6	0.2	0.6	0.1	3.5	0.3	50	20	491
• Clam	90	13	4	0.3	0.2	0.1	0.2	1.8	0.4	0.1	16	49.4	65
• Cod	12	1	44	0.6	0.1	0.1	0.1	2.1	0.2	0.2	7	0.9	65.2
• Crab, Alaskan King	7	7	~	~	~	0	0	1.1	0.4	0.2	44	9	~
• Crab, Dungeness	27	3.5	~	~	~	0	0.2	3.1	0.4	0.2	44	9	~
• Eel	1043	1.8	~	4	0	0.2	0	3.5	0.2	0.1	15	3	65
• Halibut	47	0	~	0.9	0.1	0.1	0.1	5.8	0.3	0.3	12	1.2	61.8
• Herring	28	0.7	1628	1.1	0.1	0.1	0.2	3.2	0.6	0.3	10	13.7	65
• Lobster	21	0	~	1.5	0.1	0	0	1.5	1.6	0.1	9	0.9	80.9
• Mackerel, King	218	1.6	~	~	~	0.1	0.5	8.6	0.8	0.4	8	15.6	~
• Mollusks	48	8	~	0.5	0.1	0.2	0.2	1.6	0.5	0.1	42	12	65
• Octopus	45	5	~	1.2	0.1	0	0	2.1	0.5	0.4	16	20	65
• Oyster	13	8	~	0.1	~	0.1	0.2	2	0.5	0.1	10	16	65
• Roe	90	16	12.1	7	0.2	0.2	0.7	1.8	1	0.2	80	10	335.4
• Salmon, Coho, farmed	56	1.1	~	~	~	0.1	0.1	6.8	1.1	0.7	13	2.7	~
• Salmon, Coho, wild	30	1	~	0.7	0.1	0.1	0.1	7.2	0.8	0.5	9	4.2	94.6
• Sardine	32	0	272	2	2.6	0.1	0.2	5.2	0.6	0.2	12	8.9	85
• Scallop	15	3	~	0	0.1	0	0.1	1.2	0.1	0.2	16	1.5	65
• Shrimp	54	2	152	1.1	0	0	0	2.6	0.3	0.1	16	1.5	80.9
• Snapper	30	1.6	~	0.5	0.1	0	0	0.3	0.7	0.4	5	3	65
• Tilapia	0	0	~	0.4	1.4	0	0.1	3.9	0.5	0.2	24	1.6	42.5
• Tuna, canned, light	~	0	~	~	~	0	0.1	13.3	0.2	0.4	4	3	~
• Tuna, canned, white	6	0	~	~	~	0	0	5.8	0.1	0.2	2	1.2	~
• Tuna, yellowfish	18	1	~	0.5	0.1	0.4	0	9.8	0.7	0.9	2	0.5	65

Table 20.10. Seafood and Vitamins. USDA.

Chapter 21

Resources and Testimonials

You can dive deeper into any topic with my resource guide. I have made a guide of subject matter experts, podcasts and books that can further support your personal needs. Remember, no one cares for your health as much as you do. Make sure to be in the driver seat. You can download the guide at www.carnivorecure.com/resources.

Carnivore has so many testimonials and anecdotal healing stories. You can learn of some powerful healing stories at www.carnivorecure.com/testimonials.

Chapter 22

Closing Thoughts

There are many ways of going forward, but only one way of standing still.

—Franklin D. Roosevelt

Balancing real life and the perfect diet for optimal health

I WANT YOU to walk away from this book, being more informed and empowered to make the decisions that work for your life. The discussion topics will always be here, and when you are ready to focus on any one particular topic, you can come back and focus on that respective section. It is unrealistic to always consume organic organ meats and always be plastic-free. You must find a balance that works for you.

What matters more is what you do for 90% of the days than trying to be 100% but failing most days. I'd rather you practice optimal health eating most days but also practice self-love and self-compassion on days that aren't as ideal.

As the body becomes stronger, you may be able to tolerate more foods. Eating off-plan may be possible. I want you to be able to choose what you want to eat when you go on vacation. If you want to try a baguette, because it's the food to try in France, I'd want you to be at a level of health, where it's a realistic option. Resiliency is the true goal for optimal health and what the body is designed to handle. The goal is metabolic flexibility, where the body can use both

glucose and ketones, interchangeably, even if you choose meat-only and ketones on almost all days.

To get to this point, you must heal the body and mind. If eating off plan leads to uncontrolled bingeing, and then excessive compensatory behaviors (e.g., fasting, exercise), you still have some work to heal your relationship with food. If you focus on root cause healing, you will have room to grow again and thrive.

If you want to share your Carnivore Cure journey with me, please share your stories at stories@carnivorecure.com.

Chapter 23

Carnivore Cure: The Program

I want to introduce you to the Carnivore Cure program. This program will provide community support, resources to keep you successful, and the accountability to help get you to thrive on the Carnivore Cure protocol.

If you found the content of this book helpful but need help to get you back to optimal health, this program is for you.

You can learn more at www.carnivorecure.com/program

Acknowledgments

Education is the most powerful weapon which you can use to change the world.

—Nelson Mandela

I HAVE ALWAYS wanted to write a book. Never in my wildest dreams did I think it would be a meat-based elimination protocol. I *never* knew how much effort is required to publish a book: it is a real labor of love. Writing the first manuscript is only 20% of the process of the 1,000+ hours used on the making of Carnivore Cure (I have a time tracker). I am passionate about sharing a comprehensive resource for optimal health with nutritional and lifestyle support.

I could not have made this book become a reality without the following people.

I'd like to give a special thank you to my very supportive and loving husband, Kevin Cho. I would never have been able to make Carnivore Cure without his support. He is a best-in-class father and took care of the boys while I was locked up in the office working on Carnivore Cure. Thank you, Kevin, for being a sounding board during the entire process, motivating me when I would lose steam, and introducing me to 75Hard. BLY.

Thank you to the advocates in the nutrition community who have provided me guidance, knowledge, and friendship. Without you, this book couldn't tell the story that it does—lastly, deep gratitude to my editor for challenging me and polishing this book to be even better.

———

(in alphabetical order)

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Thank you to my clients for entrusting me with your healing journey. I am always rooting for you to get back to optimal health.

Lastly, thank you to the Nutrition with Judy and #Carnivore75Hard community. We are all in this together, and we really *do* hard! I see the heart in each and every one of you. Thank you. You motivate me every day, and I'm fighting this fight for you and our future generations.

Always have hope.

About the Author

Judy Cho is a certified nutritional therapy practitioner and holds a Psychology and Communications degree from the University of California, Berkeley. Judy has a holistic health private practice, serving both clients remotely and in Austin, Texas.

Judy works with clients by focusing on root cause healing for an array of health challenges. Together, they work to create individualized solutions, prioritizing nutrient-dense foods that are sustainable for the long term. Prior to becoming a nutritional therapist. Judy Cho was a management consultant at a top 5 consulting firm for over 12 years. She is now leveraging her psychology degree and nutritional therapy education to help serve her clients and the community in the most effective ways.

Judy is a nutritional advocate for a meat-based diet, and on most days, her kids follow a low carb or ketogenic diet. Judy focuses on debunking nutritional misinformation and promoting self-knowledge and self-advocacy. She shares bite-sized holistic nutrition information with her infographics on social media platforms. She is passionate about helping people be their best selves and live their best lives.

Animal-based foods gave Judy a second chance at life and she is passionate about giving back, healing the world one steak at a time.

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