

A Critical Look at 'The China Study' and Other Diet Plans

Story at-a-glance

- Although veganism has some health benefits, it is also loaded with many disadvantages and is unsuitable for many, especially if you have certain genetic polymorphisms predisposing you to poor beta-carotene conversion
- People with polymorphisms causing poor conversion of beta-carotene are at high risk for reproductive problems, skin and eye problems and poor dental health
- The blood type diet, detailed in “Eat Right 4 Your Type,” often works well for those with blood type O, as those recommendations are consistent with a healthy diet. It typically does not work well for the other blood types
- Nutrient cycling (cycling between higher and lower amounts of fat, net carbs and protein) and cycling between high and low calorie intakes (fasting and feasting) appear to be foundational criteria for optimal biological functioning
- If you’re on a ketogenic diet, it’s important to cycle high and low amounts of net carbs once your body is able to efficiently burn fat for fuel in order to optimize your metabolism. Cyclical fasting is also recommended

By Dr. Mercola

Denise Minger is perhaps most noted for her comprehensive rebuttal of "The China Study" some eight years ago. She's heavily vested in the vegan versus omnivore battle, having cycled through vegetarianism and raw veganism, finally coming full circle to being an omnivore.

Minger took to vegetarianism when she was just 7 years old. "I was eating steak one night at dinner and almost choked on it. I developed some kind of phobia surrounding things with meat textures and went vegetarian overnight," she explains.

Raw Veganism Took a Toll on Health

However, during the 10 years she remained a vegetarian, she began developing [food allergies](#), including wheat and dairy allergies. "By the time I was a teenager, I was really health-conscious," she says. "I had to get into that whole scene just to stay healthy." At age 15, she discovered the [raw vegan](#) movement and got on the 80/10/10 diet, promoted by Dr. Douglas Graham. The diet is based on the hypothesis that we should eat what other primates eat, particularly frugivorous chimpanzees and bonobos.

"I was reading about it online at the age of 15 without having any background in human biology, physiology or anthropology ... I fell into this trap of logic, that humans are the only animals that cook our food. We're the only animals that eat this species-inappropriate diet, [so] I went raw vegan overnight," she says. "For one year straight, [I ate] nothing but fruits, vegetables and some nuts — all uncooked.

I did great for the first month, as most people do when they stop eating crappy foods. After that, I started losing weight and muscle. My hair was falling out. My energy levels were fluctuating like crazy. I was in high school at the time, taking the Scholastic Assessment Test (SAT). My brain fog got so bad at one point that when I was taking the SAT, I would read the question and by the time I got to the end I couldn't remember what the first part said ...

The kicker for me, because I've always taken great care of my teeth, was at the end of this period of raw veganism I had 16 cavities in my mouth, after a lifetime of what had previously been perfect dental health ... It was actually the dental health issue that really turned my mind around ... At that point, I had to let go of the vegan philosophy. I had to start questioning things ...

That's when I came across things like the Weston A. Price Foundation, which [details] what humans have been eating that has supported health in the past. I learned about the paleo movement — different forms of health-conscious omnivory. That's where I ended up. It was a process."

Debunking 'The China Study'

As mentioned, Minger produced a very comprehensive critique of "[The China Study](#)" which is the scientific justification for many vegan positions. Her analysis — which some suspected to be funded by the meat industry — was actually undertaken while recovering from an accident. At the age of 22, she was hit by a car while riding her bicycle and shattered her elbow. Her convalescence afforded her the time to work on this project.

"I got a huge book of the raw 'China Study' data. I love numbers. I have fun with correlations. I have fun looking at patterns. My brain gets happy. I spent about two or three months poring over the data. I needed a project, because I had nothing else to do.

I was poring over the data and that's when I realized I needed to write a critique of the book. So much of what [author T. Colin] Campbell said was not supported by his own data. I just felt like if there's anything I needed to do in life, it was going to be this.

I didn't expect anyone to read it. I had a little blog. I like to say I had six readers, five of which were my mother on different computers. I didn't realize at the time how much interest the critique would gather; how much interest there was in that book itself. I hadn't really seen the rivalry upfront between the vegan and the paleo worlds. When I released this critique, I didn't know it was going to be that influential," she says.

Minger developed quite a bit of notoriety as a result of that critique, especially in the vegan community. She's been vilified by many, including Campbell, who wrote personal rebuttals to her commentary on his work. Some have gone so far as to characterize her as someone who's promoting processed food.

The Case for Lowering Protein Intake

For all its drawbacks, there are benefits to veganism. The biggest one, from my perspective, is that vegans have — compared to those who eat the standard American diet — a significantly

lower protein intake. I think there are valuable insights that can be drawn from that, which can be integrated into a low-carb paleo approach. Minger agrees, saying:

"For the protein issue, what I find interesting is that whenever we look at the actual China Study, for example, when you look at their food intake, it's much different in terms of the types of animal parts they consume than what we see in America.

The protein issue is complicated, but I will say that high methionine intake — for example from muscle meat — [needs to be balanced with] glycine. You get that by eating the entire animal, the skin, tendons, connective tissue — all the stuff that Americans typically discard ...

In the China Study, you don't see them eating steaks and chicken breasts at every meal. Even the lower animal product-consuming societies, a lot of them eat insects. A lot of them eat the weird parts of the animal. I think that's imperative for staying healthy on an omnivorous diet. Because the way we eat meat in America is pathogenic. It's not healthy. But it's not necessarily because animal products are bad for you ...

What was amusing to me, because it was completely left out of 'The China Study' book, was that the healthiest populations were the seafood eaters ... They had the best health outcomes. The only disease that they had more of was liver cancer. That was because they were living in humid areas where aflatoxin was more prevalent ... But it wasn't because of the animal protein. It wasn't because of the fish."

This makes sense considering the importance of long-chained [omega-3 fats](#): eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). Those who restrict themselves to a plant-based diet are only getting alpha-linolenic acid (ALA) which, while being a precursor for EPA and DHA cannot be converted at significant, therapeutic levels.

Protein Cycling

Clearly, the composition of the animal protein is a significant issue. We don't want [processed foods](#). We don't want [meat from factory farms](#) that is contaminated with glyphosate (due to contaminated grain feed). But there's also the issue of the amount. Many are simply eating far [too much protein](#), which (when consumed in excess) activates mTOR, a pathway involved in both aging and cancer. Pulsing higher and lower amounts of protein also seems a wise strategy.

"When we look at historical groups of humans, the animal food intake was generally on the lean side. We don't have year-round access to these big fatty animals ... It's going to be seasonal when it occurs at all," Minger says. "I'm reminded of a study on Australian aborigines. They put people out in the wild to try to acquire foods from their environment and survive on that ...

Their fat intake ended up being something like 8 to 12 percent, because the animals were so lean and the lean protein intake was consequently much higher. I have trouble believing that animal protein itself is going to be a problem. I think what might be a problem is this consistency thing — the idea that eating the same foods year-round, without any fluctuation in the composition of the diet, is healthy. I don't think that's the case ...

I think things like protein cycling might be therapeutic for humans. I think that even carb cycling and going through different periods of different macronutrient intakes instead of always being low-fat or always being low-carb [is a good idea]. That's probably what the human body is best adapted to."

Macronutrient Cycling — An Overlooked Component of Optimal Health

In deconstructing and assessing the low-carb, high-fat approach, Minger concluded the lack of high and low nutrient cycling was one of the main problems, especially long-term, and particularly for women. "I do one-on-one consulting with people," she says.

"A large group that I have come in contact with are women who've done low-carb. Their thyroid function is tanking. They're gaining weight. They feel terrible. Their hair is falling out. It happens with men too sometimes, but I think women, hormonally, are more sensitive to the lack of carbohydrates."

She's also found evidence suggesting chronic lack of carbohydrates may be having an adverse effect on your gut microbiome. In his commentary, "Sorry Low Carbers, Your Microbiome Is Just Not That Into You,"¹ Jeff Leach with the Human Food Project details the likely shifts found in the gut microbiome composition of people who consume low-carbohydrate diets. Whether or not those shifts are wholly detrimental or not is still unknown, but it's worth keeping an eye on.

Minger is equally ambivalent about long-term, chronic high-fat consumption, as some of the evidence suggests it may increase gut permeability and the transport of endotoxin from gram-negative bacteria into the bloodstream, which increases chronic inflammation and related health problems.

"On one hand, we see people switching away from the standard American diet to low-carb. Yeah, they're going to feel great. Yeah, they're going to lose weight. There's going to be this initial honeymoon period, just like I had with raw veganism. My question is what happens over the course of many years on a large scale ... I'm wondering what the bulk of the evidence is going to show. I don't know if we really know that yet."

From my perspective, I think there are compelling reasons to suspect one might run into problems, for many of the reasons Minger cites. It appears nutrient cycling (i.e., cycling between higher and lower amounts of fat, net carbs and protein), and also cycling between high and low calorie intakes (fasting and feasting), are foundational criteria for optimal biological functioning.

The challenge is to find that happy balance. When writing "[Fat for Fuel: A Revolutionary Diet to Combat Cancer, Boost Brain Power, and Increase Your Energy](#)," I dove deep into the scientific literature looking at this aspect of health.

Cyclical Ketogenic Diet Is Ideally Combined With Cyclical Fasting

First of all, the late Dr. Joseph Kraft showed that using sensitive oral glucose loading and testing insulin levels that [insulin resistance](#) is pervasive. Based on a more refined definition of insulin

resistance, at least 80 percent of the population have [diabetes](#) in situ,^{2,3} which means they're insulin resistant even though their fasting glucose is normal.

This is where low-carb can be really useful, yet it alone will still not be enough for many. A lot of people need to get even more aggressive and do [fasting](#). Once you've done that for a while and resolve the insulin resistance, you need to cycle net carbs (total carbs minus fiber) back in.

"Low-carbohydrate eating ... is a great tool to lose weight, and lose fat around the organs. You start improving insulin sensitivity because of that weight loss, and because of the reduction in the energy surplus that many people are constantly surrounded with. But I use the analogy of a [broken] refrigerator.

Your refrigerator breaks. You can do one of two things. You can say, 'OK, I'm never going to buy any perishable food again. Everything I'm going to buy is going to be dry goods as long as the freezer or the refrigerator is broken.' Or, you can fix the refrigerator.

Low-carbohydrate diets are like saying, 'Let's not use our refrigerator anymore.' Let's not use our carbohydrate metabolism pathways anymore. Let's just avoid those. It's not actually fixing the issue. As anyone who knows who's been low-carb, you go low-carb for a while, and then you reintroduce carbohydrates and, whoa, it's terrible.

Your blood sugar goes crazy. You feel awful. It's like, 'Wow. The carbohydrates are terrible.' No. It's because your body is no longer working to metabolize them efficiently."

The converse can also occur. If you suppress insulin for too long, your blood sugar will tend to rise from hepatic gluconeogenesis. If you reintroduce carbohydrates at that point, it will raise insulin and lower your blood sugar. You can also eat too much fat; since fat is high in calories, the excess calories alone can lead to weight gain. As mentioned above, protein intake also needs to be regulated to avoid mTOR activation.

Traditional paleo is frequently high-protein, high-fat, similar to the Atkins approach. But you're not going to get all the benefits unless you restrict protein. As a general rule, I recommend limiting protein to half a gram per pound of lean body weight, to ensure you're getting the protein you need for muscle maintenance and repair. The answer is not to cut protein out altogether. You do need some, just not the enormous amounts most Americans are used to eating.

Focus on Nutrient Density

When asked what the best animal food composition might be, Minger stresses the importance of nutrient density over any specific dosage recommendations, as the ideal amount will depend on the type of meat you're eating. "For my own diet, I focus on organ meats and shellfish," she says. "Those are the primary foods I eat that are of animal origin. Oysters are my favorite. Nutritionally, if you look at liver and oysters, oysters are kind of like the liver of the ocean."

People who shun animal foods due to ethical concerns about eating something that is highly sentient can also take heart in the fact that oysters lack the central nervous system "that would make them equivalent to a cow." "There's a bivalve vegan movement, where people are vegan

with the inclusion of certain shellfish. I think that can go a long way for people to balance out a vegan diet," she says.

As for cooking, Minger recommends using gentle methods to avoid the creation of carcinogens associated with high-temperature cooking. These byproducts "seem to be driving the correlation between meat consumption and different cancers that we see in observational studies," she says.

"Whenever you look at a study that actually controls for the cooking method, typically once you take away the high-heat kind of strategies for cooking your meat, the correlations with various diseases start to diminish, if not disappear completely." Byproducts created during grilling and frying include heterocyclic amines and polycyclic aromatic hydrocarbons that form carcinogens. So, don't overcook your meat, and balance muscle meat (steaks) with organ meat and other animal parts.

How Minger's Diet Has Changed Over the Years

When asked how her diet has changed over the past seven years, and what insights changed her approach to eating the most, Minger replies:

"I started out really fruit-based from my raw vegan history. I would eat a ton of fruit in the morning; smoothies ... In learning more about the gut microbiome, learning about [digestive-resistant starch](#); different forms of fiber and their effect on the body, I've been incorporating more legumes, lentils and potatoes that have been heated and cooled [to increase] the resistant starch content. I think that has helped a lot.

I've also flipped my diet in terms of staggering macronutrients throughout the day. I used to start with a lot of carbohydrate and not much else (in the form of fruit). Now, I usually start with a lot of protein and vegetables, and have my high-carb meals at the end of the day. I find that helps with sleep, energy levels [and] focus."

It's worth noting that legumes may not be ideal for everyone, especially if you have autoimmune issues. I've previously interviewed Dr. Steven Gundry, author of "[The Plant Paradox: The Hidden Dangers in 'Healthy' Foods That Cause Disease and Weight Gain](#)," on this issue, and I believe his theories are solid.

Minger, who does a lot of work with autoimmunity, agrees lectins can be problematic if you are susceptible to autoimmune problems, whether caused by genetics, lifestyle, antibiotic use or [gut microbiome](#) issues. "At that point, the lectin problem can be real," she says.

"There can be a legitimate reason to avoid foods that are high in certain lectins, especially the ones that are individually triggering autoimmune responses. But for people with a healthy gut microbiome, I don't see that being necessarily bad, because if you look at human history ... the lectin content of wild foods is generally pretty high.

There's going to be a long adaptation period for us to learn how to coexist with those lectins in our diet. I think [the larger issue] is that the modern environment is creating a really unhealthy microbiome that's making it so some people cannot handle what should be a natural lectin load. That's my takeaway right now, subject to revision."

Critiquing the Blood Type Diet

In preparing for this interview, I watched some of Minger's latest material on YouTube. One of her most recent videos was a Weston A. Price Foundation presentation in which she critiqued Dr. Peter D'Adamo's blood type diet, detailed in his book, "Eat Right 4 Your Type."

I tried this diet back in the '90s and had to quit because it made me diabetic. My personal take on it is that while his recommendations for blood type O, which is about half the population, is consistent with what I believe is a healthy diet, it doesn't seem to work well for the other blood types. According to Minger:

"The fundamental issue with everything he's saying is that it's all wrong. The premise of his diet — that foods have different lectins [that] interact with what's expressed on our blood cells to cause issues within the blood, which then causes inflammation and disease — there's absolutely no mechanistic evidence showing that we can obtain high enough levels of lectins from certain foods, and that those foods will specifically interact with our specific blood type to create these problems.

That evidence just isn't there ... [He may have had] a lab, but there are problems with the research actually being published. It certainly hasn't been replicated by other researchers. It's more of a, 'This is what I found. You have to take my word for it, because I wrote a book and I have a [medical] degree.' There's a certain, 'Just trust me. I'm a scientist,' behind that. If there's anything I don't like, it's that ...

What fascinated me ... [was that] our ABO blood group can actually influence the composition of our gut microbiome for people who are secretors — people who secrete their blood type antigens on the surface of mucous cells throughout the body, the saliva and the gut, the gut in particular.

Let's say you're a blood type A and you're secreting the A antigen on different cells within the gut. There are going to be certain bacteria that use that antigen as a food source and as an attachment site. Those specific bacteria are going to be more attracted to your microbiome. They're going to set up camp there, in a way that they might not be doing to somebody who's a blood type O. You're actually going to start shifting the proportion of different bacteria because of your blood type.

Tied into this is the idea of being a secretor versus a non-secretor. Most people are secretors. They will express their blood type antigens on the surface of different cells throughout the body. About 20 percent of the population are non-secretors.

For this group, regardless of what their actual blood type is, they have a much higher risk of a lot of digestive diseases, a lot of different health conditions in general, related to the fact that their microbiome is fundamentally different. It's providing a lack of attachment sites for different bacteria. So, there is an influence of blood type on different things going on in the body. It's just not through D'Adamo's theory."

Awesome Omnivore

After taking a professional hiatus, Minger is now working on a few new projects, including an e-book called "Awesome Omnivore." The book is a how-to guide for eating animal products in a way that minimizes potential risks and maximizes nutrition, including guidance on balancing methionine and glycine, differences in A1 versus A2 dairy, how to prepare meat to reduce carcinogen exposure, how to modify your animal food consumption based on genetics, and how to combine meat with other foods to reduce the absorption of heme iron to lower your risk of intestinal cancer and other [health problems related to excessive iron](#).

High iron increases oxidative stress and can cause serious mitochondrial dysfunction. I have a genetic condition called thalassemia, which predisposes me to high iron levels. I have to be really vigilant about keeping my iron level low for these reasons.

As explained by Minger, because the molecular structure of heme is so similar to chlorophyll, if you eat lots of green leafy vegetables with your steak, the chlorophyll will inhibit absorption of some of the iron. "That alone is going to make that meal probably, on the whole, healthier for you," she says.

"There's this kind of dichotomy — you have the vegetable eaters and the meat eaters. The meat eaters are not usually eating enough vegetables to offset the heme issue. But if you look at studies that actually adjust for that one variable, the link with meat's problems tends to disappear.

It's, again, veggies to the rescue. But it doesn't mean that you can't eat meat too. Anyway, the book is going to be a collection of things people can do to ensure that the meat they're consuming, the eggs and the dairy products (if they're doing that), are as healthy as possible."

Plant-Based Paleo

Minger is also working on a book about plant-based paleo, designed for people who are committed to avoiding animal products, for whatever reason. The aim of this book is to provide strategies to help you stay as healthy as possible for as long as possible within the limitations of a plant-based diet.

"There are vegans who have survived a long time on their diet. It's not impossible. The human body is incredibly adaptable. But we need to understand what's working for those people.

We need to understand that there are a lot of genetic components that go into being able to convert plant-based nutrients into their active forms. Take beta-carotene, for example. People who have really good conversion of beta-carotene into retinol, they're probably not going to run into reproductive issues, teeth issues, skin issues or eye issues, like I did.

But for about 45 percent of the population, there are mutations with the BCMO1 gene that prevent that conversion from being efficient. If you have two very common polymorphisms, your conversion rate is going to drop by almost 70 percent.

Another less common mutation will tank your conversion by 90 percent. If you're a vegan, you're not eating any preformed vitamin A, and if you have some of those mutations, you're going to

have problems pretty quickly. How do we work with people's genetics? How do we work with their dietary limitations?

Supplements would be good. I'd love for people to take cod liver oil if they can get over that one issue. But you need to be really aware of your specific conditions ... I have those BCMOI mutations. My vitamin A conversion is terrible. That's part of the reason that eating liver was a huge boon for my diet. It's my first concentrated source of vitamin A that I had in a decade, more than a decade."

Lifelong Learning Is Key to Staying Ahead

As nutritional science keeps moving forward, we're bound to learn new things about what we currently think of as factual. For example, Minger touches on evidence suggesting really low-fat intake may actually improve carbohydrate metabolism.

"We have the Randle cycle. There's competition between free fatty acids and glucose in the bloodstream for use as fuel. I think we have enough evidence to say pretty clearly that when you combine fat and carbohydrate within the same meal, if you're a healthy person — you're going to see a reduced blood-glucose response, but you're going to see the same amount of insulin secretion.

Fat doesn't decrease the insulin needs of your body when you're eating carbohydrate. It kind of amplifies it. There have been studies where they'll take a potato, feed it to a diabetic, then repeat the study with butter added ... The more butter added to the potato, the more insulin the diabetic needs to use to deal with that meal. There's an interactive effect, even within the span of one meal, between fat and carbohydrate ...

I don't believe in staying at one [end of the spectrum, i.e., high-carb or high-fat] forever. Obviously, you need fat-soluble nutrients. You're going to need some fatty foods that are highly nutritious too. At the same time, you're going to need to cycle in more carbohydrate to deal with the long-term consequences of ketogenic diets ...

"I believe there's a way to integrate everything. What it comes back to is all the warring diet communities need to let go of the ego and communicate with each other. Stop saying, 'We own the truth.' Start listening to the other side and be curious about why things are working for them.

For me, that's the way I've learned best — by challenging what I believe. Because if what I believe can be dismantled, then it's not a good belief to hold. You need to constantly revise your theory about the world, about nutrition, about everything. It needs to be in a state of flux."

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