

Vitamin C and All Meat Diets

by Paul Mabry MD | Oct 12, 2017 | Uncategorized | 28 comments



All meat diets contain much less Vitamin C than plant based diets, this is not controversial.

A common argument I hear against my own "Zero Carb" diet which consists of

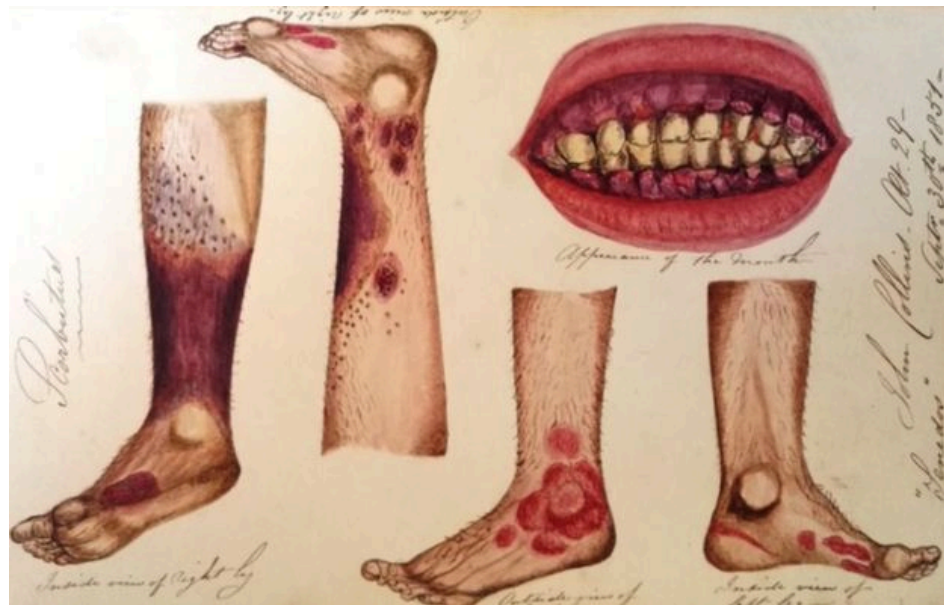
only meat, eggs, cheese, butter, spices like pepper, paprika, turmeric and other common dried spices to flavor my meat is that a diet like that is too low in Vitamin C (also called ascorbic acid or ascorbate) and that I am going to get sick because of that deficiency. That certainly can't be universally true since I have followed my diet for 914 days as of today (10/11/17) and I have never been healthier. The 2 most common reasons people think a diet low in Vitamin C is harmful are first because Vitamin C deficiency has been shown to cause a serious disease which we will talk about next called Scurvy and second that Vitamin C is a strong antioxidant and serves as an electron scavenger in several enzymatic reactions in the body and to prevent oxidative stress. I will also address this concern later in this post.

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Vilhjalmur Stefansson

Scurvy which has mostly affected sailors whose diets were low in vitamin C but also low in meat and high in carbohydrate were the worst affected group. The disease can develop in a few weeks and cause weakness, muscle aches, loose teeth, bleeding gums, discoloration of the skin and poor wound healing among other things. It was also seen among early Arctic and Antarctic explorers for the same dietary reasons. The ability of Vitamin C containing citrus fruits to reverse the disease has been documented since the time of the Crusades. What causes scurvy is the inability of the body to hydroxylate the amino acids proline and lysine which are abundant in collagen the major connective tissue protein that holds our bodies together leading to weak collagen and the symptoms.



Vilhjalmur Stefansson was a Harvard trained Anthropologist who later became a professor at the same institution. He spent over 10 years living in the Arctic studying the coastal Inuit before they adopted a western diet. He also led many Arctic expeditions. The Coast

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Inuit at that time consumed almost no plant foods and were vigorous and healthy with almost no heart disease, diabetes, cancer and no problems with scurvy. He adopted the native diet and would lead expeditions on the ice lasting up to a year while living only on seal meat and polar bear meat with no supplements and claimed to have had the best health of his life. He helped other explorers learn how to do this and the only time he saw scurvy was when these “trainees” cheated and brought along sugary and carbohydrate laden foods which would often lead to symptoms of scurvy. So how could a diet so low in Vitamin C prevent Scurvy? Simple, the problem in the disease of scurvy is the inability to turn proline and lysine into hydroxyproline and hydroxylysine without Vitamin C as the catalyst. It turns out meat is rich in both hydroxyproline and hydroxylysine which can be absorbed from the gut and used by the body so much less hydroxylation needs to take place, hence less vitamin C needed. Here’s a quote from [this scholarly article](#):
“Prolidase also hydrolyzes hydroxy-proline-containing dipeptides. These small peptides (containing proline or hydroxyproline) in the lumen of the small intestine can be directly transported into enterocytes (absorptive epithelial cells) by H⁺ gradient-driven peptide transporters”. When Viljalmur returned to New York in the 1930’s and talked with local doctors about the benefits of an all meat diet, they refused to believe him and told him he would develop scurvy within 1-2 months. He and one of his sled drivers named Anderson volunteered to be monitored in the hospital and live exclusively on meat for 1 year allowing doctors to draw whatever laboratory studies they liked. He and Anderson remained healthy with no signs of scurvy or other medical problem for the year. The experiment was carried out at Bellevue Hospital. Below is a link to download a PDF of this study which was published in “Clinical Calorimetry”.

Steffanson’s Bellvue Experiment

Here is a link to the full text of the book “The Fat of the Land” which is the autobiography of Stefannson’s sojourn among the Coastal Inuit Eskimos of Alaska.

The Fat of the Land

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After I explain why scurvy is not a problem, inevitably I hear but Vitamin C is such a good antioxidant and participates in several enzymatic

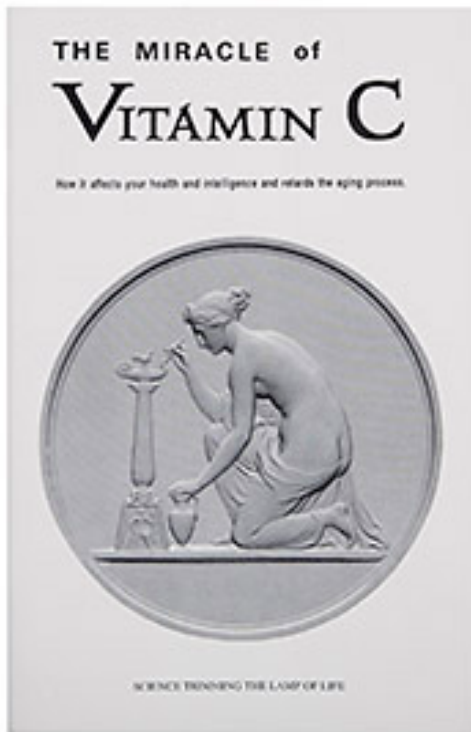
reactions in the body. I counter by asking “if that’s true why did our line of the ape family tree decide to lose the ability to make it about 65 million years ago?” It was because we had earlier made another change and stopped producing uricase an enzyme that lets us break down the substance uric acid (aka urea) which is a breakdown product of DNA bases and Amino Acids that are burned like sugar. Because of this inability to further break down uric acid we have a ton of it around and it is an excellent antioxidant that can do the job of Vitamin C in these reactions. Glutathione which we also easily make can take Vitamin C’s place in these reactions. Uric Acid is the main ingredient in urine after water and give urine it’s name. [Here’s an article about that.](#)

Another reason that people on low carb, high fat diets don’t need as much Vitamin C is that the high blood sugars experienced by people eating a high carbohydrate diet make it difficult for Vitamin C to get into the cells of our body. Remember that 2 slices of dry whole wheat toast will raise the blood sugar of normal people to at least 140 mg/dl 90 minutes after consumption and much higher for anyone who is insulin resistant where an equivalent amount of calories in the form of meat is unlikely to raise the blood sugar to 100. [This study](#) shows that Vitamin C which is a ver



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similar molecule to glucose and is made from glucose uses some of the same pathways as glucose to enter the cells. When a lot of glucose is around Vitamin C can have trouble entering the cells to do it's work because the transport pathways are clogged with glucose.



But, you say, "I heard Nobel Laureate Dr. Linus Pauling say that high doses of vitamin C would prevent every known disease and help me live forever." I would simply refer you to [the Wikipedia article on Vitamin C](#). Here's a laundry list of Vitamin C claims that have not been supported when scientific studies were done:

- Studies have shown that Vitamin C failed to prevent lung cancer, prostate cancer, colorectal cancer (one meta-analysis found a weak protective effect for colorectal cancer no others did), or breast cancer.
- No improvement in heart attack risk was seen with Vitamin C however there was a relationship where higher circulating vitamin C signified a small decrease in stroke risk.
- There was no improvement when Vitamin C was used to treat rheumatoid arthritis.
- There was no benefit to prevention or treatment of the common cold with Vitamin C except in individuals exercising vigorously in cold environments.

But Vitamin C also has downsides. [This article published by Harvard Medical School](#) reviews several studies that have linked Vitamin C supplementation with kidney stone formation. The bottom line is that numerous "Natural Experiments" like the Historic Coastal Inuit and the

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Maasai Warriors who eat only meat, blood and milk and are forbidden by religious tradition from eating any plant derived foods during their warrior years, that clearly show no evidence of harm from a relatively low Vitamin C, meat based diet and no evidence of scurvy.



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28 Comments



Butsch on October 12, 2017 at 1:25 pm

Regarding the “kidney-stone formation risk” of vitamin c the science behind that is flawed.

The study did not take the kind of diet into account.

E.g. what would be the outcome if people ate a carnivorous diet?

See here: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1472830/> (second study – different diet – less oxalate in urine).

For a nice review of the kidney-stone claim see

<http://orthomolecular.org/resources/omns/v09n05.shtml>

and

<http://orthomolecular.org/resources/omns/v01n07.shtml>

As to my own experience with vitamin c: In my case taking vitamin c reduces cold symptoms significantly.

[Reply](#)

Chris S on August 26, 2020 at 1:56 pm

Since cutting out a majority of sugar and carbs, I've had about 2 colds in 7 years. Once you put your body on the right fuel, it has an exponentially higher chance of fighting stuff off. This is living with 4 school-age children as well.

[Reply](#)

Paul Mabry MD on August 30, 2020 at 11:47 pm

that's been my experience also, if you stop poisoning your body, wonderful things can happen

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Tee on January 25, 2021 at 10:27 pm

As to kidney stones and vitamin C, I believe Pauling said it was the acidity, not the vitamin C per se which may cause the stones. Buffering the acid would eliminate this. I never checked up on this but it made sense. Things precipitate out of different pH's.

[Reply](#)

Paul Mabry MD on March 3, 2021 at 5:12 am

Thanks for the info.

[Reply](#)

Dr. Karl Goldkamp on October 12, 2017 at 4:01 pm

Nice work Paul. As a Naturopathic Doctor I've always had a difficult time with this particular aspect of keto, or low carb, or no carb. Even Dr. Veech agrees this is where Dr. Pauling got it wrong. However my personal experience does bring me to at least questioning the value of carbs (veggies) with an open mind. I have had no problem going without carbs..... but I love my veggies and have a garden. Our smoked Jalapeno poppers are to die for.

I appreciate your open review of the issue.... it encourages me to examine my own beliefs.

[Reply](#)

Paul Mabry MD on October 17, 2017 at 6:35 am

Thank you Dr. Goldkamp. I don't eat vegetables because I was addicted to sugar and to starchy vegetables. For strong addictions I think total abstinence is the best approach so I eat Zero Carb. I also strongly believe that humans can survive extremely well on a meat based diet alone. That having been said I believe that humans have also always added some vegetable foods to their diet and are descended from primarily vegetable eating ancestor species and thus still have the capability to fall back on plant foods when meat is

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not in plentiful supply. What I consider to be the most important message people need to get is that sugar is an addictive substance that slowly over time will ruin both your physical and mental health (See Dr. Robert Lustig's just released book "The Hacking of the American Mind". And that if you have made your body insulin resistant with sugar the way to heal is to stop all sugar, keeps carbs under 20 grams per day, keep protein under 1.5 grams per kilogram per day of ideal body weight and do intermittent fasting with an eating window of 8 hours per day or less. If a person can do this while including plant foods without overeating carbohydrates I think that's fine. For people who didn't damage their system and are not insulin resistant at all I just recommend avoiding sugar, processed foods especially carbohydrates laden grains and processed seed oils high in Omega-6 fatty acids like soy, canola, and corn oil.

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Victoria Velkoff on October 12, 2017 at 10:11 pm

Dear Dr. Mabry,

Thank you for providing this site and describing your personal journey with low Carb to zero carb. In particular, I commend you for admitting that your initial medical school education was incomplete and erroneous when it came to nutrition and health advice. Unfortunately, I have worked with many MDs who would never be so open-minded as to admit that they were ever wrong or mis-informed about their profession.

Vitamin C: I am curious if you looked at the work of Fred Klenner, MD, Robert Cathcart, MD, Russell Jaffe, MD, or Thomas Levy, MD (and others) while researching VC therapy? All of these physicians utilized large doses of ascorbic acid in their clinical practices.

Note: the key to successfully use ascorbic acid as a treatment lies in the proper dosage and frequency of dosing – taking a sub-clinical dose is futile. Each individual's requirement for ascorbic acids is different – one must first determine what the optimal dose is by dosing to bowel tolerance (find Dr. Cathcart's protocol at Vitamin C Foundation).

[My N = 1 personal journey with optimal dosing of vit. C: about 6 years ago I was having health issues due to gluten sensitivity and in my research on gluten I discovered vit. C therapy and decided to try it. (BTW, I live near Stanford University and have access to monthly lectures at SVHI.org. & have heard their lectures on vitamin C. Dr. Dale Bredesen presented his work with reversing Alzheimer's at the November 2016 meeting. So, I w

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to have this local resource. This organization live streams meetings and will post the taped lectures on their website).

I followed the Cathcart protocol and determined that my optimal daily dose was 12 grams. For five years I dosed with 10-12 grams daily and never had a cold nor the flu – except for one time when I ran out of ascorbic acid for several days and developed a severe sore throat, head cold with earache. Once I started back on megadosing the symptoms were gone in less than 48 hours. About a year ago, Dr. Jaffe presented at SVHI and he mentioned that after several years of following megadose VC therapy, one can recalibrate their dose and take a smaller dose. I am not sure why that works, but I was able to cut back to 6-8 grams per day. Then, DEC2016 I started on LCHF diet with great success. Early this summer, I noticed that I had been forgetting to dose VC every day without incident; in fact, I stopped daily dosing to see what would happen. As I knew that sugar and glucose can interfere with benefits of VC, I wondered if I was able to stop VC because of the ketogenic diet?]

Dr. Fred Klenner, a family physician, successfully treated polio patients back in the 1940s. He published his results in a peer-reviewed medical journal. Please become familiar with his work, very fascinating!

I can send links if you are interested in further information on the therapeutic benefits of optimal doses of ascorbic acid (not really a vitamin but a substrate).

Best wishes,
Victoria

Reply



Paul Mabry MD on October 17, 2017 at 6:49 am

Thank you Victoria. My article was written primarily as something people who follow a Zero Carb diet which is relatively low in Vitamin C could show to friends, relatives and doctors when they were told their diet was dangerous because of the low level of Vitamin C. I don't think taking supplemental Vitamin C is dangerous and probably is quite beneficial for some conditions. At the Low Carb USA conference this year they were talking about IV Vitamin C helping cancer patients. Unfortunately I don't think that the kind of large scale, randomized, double blinded studies that would need to say conclusively that these kinds of therapies work or don't

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are ever going to be done because most research now is funded by the pharmaceutical industry and the government, the disbursement of whose funds are highly influenced by pharmaceutical company lobbyists and professors who receive research grants and other inducements from pharmaceutical companies and you can't patent "Vitamin C tablets". My personal opinion is that people who eat a healthy whole food diet without added processed foods or sugars probably don't need to supplement Vitamin C. It may be beneficial in some illnesses but we don't have the studies to prove it one way or the other yet. Remember the people who are at risk of scurvy are sailors who ate mostly "hard tack" an unleavened white flour (processed food bread) with a little salt pork occasionally and malnourished children in third world countries who don't get enough to eat.

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Kevin on October 16, 2017 at 10:53 pm

I enjoyed this post. A while back I wrote to you regarding Ms. Hallbergs comments about a slight blood sugar rise over time when in ketosis. I did further browsing on the subject and found the theory that too much vitamin C could be indicated. After discontinuing my 3000 mg per day of vitamin C, it seems that my blood glucose readings are dropping back to normal. The idea of glucose being similar to vitamin C in structure... And that it competes for the same GLUT1 transporters to the cells. With less need for vitamin C in a carbohydrate restricted diet, it may not be good for your blood sugar levels to supplement vitamin C, even though other LCHF programs recommend vitamin C supplementation.

[Reply](#)

Paul Mabry MD on October 17, 2017 at 6:54 am

Keven, I think a healthy human body is an amazing, well-tuned machine that is capable of optimum performance and self maintenance on a diet that does not include processed foods, especially sugar, grains like ground wheat and corn which have a high glycemic index, and seed oils like soy, canola and corn oil which are high in pro-inflammatory omega-6 fatty acids and that on such a diet taking nutritional supplements is more likely to throw this wonderful machine out of balance and alignment than

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James LaMotte on April 13, 2020 at 5:24 pm

My grandmother's people—the Blood tribe of the Blackfoot Nation of Alberta, Canada and Montana, USA—ate almost nothing but meat and enjoyed excellent health until European invaders brought in smallpox, alcohol, and their carb-rich diet. Early explorers remarked on their robust health and beauty—the Blackfoot and their Crow neighbors were often said to be the finest looking people in the Americas. They ate primarily bison and elk spiced by wild sage, wild onions, and wild turnips, and they added dried berries to their pemmican. Nowadays, however, their health has been eroded by a steady diet of bread, flour, and sugar. Obesity is epidemic, as is diabetes, and now more Indians from all tribes are dying from complications from their shitty Anglo diet than died in all our many wars. It's clear to me that we have to get back to our more traditional diets—more meat, less carbs, and no damn sugar. My grandmother, by the way, lived to be 96.

[Reply](#)

Paul Mabry MD on April 30, 2020 at 1:23 pm

I couldn't agree more

[Reply](#)

Ward on October 21, 2017 at 3:26 am

Well done. Easily the best post I've seen regarding eating meat and vitamin C. Thanks for your work.

[Reply](#)

Shameer's Mulji on December 21, 2017 at 3:56 am

Very interesting article. What are your thoughts on tubers being part of healthy diet?

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Paul Mabry MD on December 22, 2017 at 5:48 pm

I think tubers can be part of a very healthy diet if you have damaged your liver with too much sugar or alcohol and are not insulin resistant and suffering from the metabolic syndrome. If you have any question on whether you are insulin resistant or not I clearly spell out on my home page how to find out.

<http://www.BornToEatMeat.com>

Reply



Rick F on January 20, 2018 at 3:47 am

As per one of the comments, if we assume that Vitamin C does not cause kidney stones then could we also assume that it would be healthy to supplement this diet with vitamin C? Are there any other downsides?

Reply



Paul Mabry MD on January 22, 2018 at 2:14 am

My research indicates that people on very low carb, high fat diets that are meat based like Zero Carb do not need nearly as much Vitamin C as people on high carbohydrate diets low in meat Here's the post I did on that. <http://borntoatmeat.com/?p=699>

Reply



Cathy on March 27, 2018 at 2:01 am

Hey Dr Paul, I do believe the research shows that Vit C does possibly cause kidney stones because it converts to Oxalic acid in the body. Oxalate is also high in many greens, other veggies, nuts etc. Veggies aren't as friendly as people are led to believe.

Reply



Paul Mabry MD on March 31, 2018 at 5:11 am

Most kidney stones are mostly Calcium Oxalate. They're really no randomized controlled trials the only trials I consider worth making dietary recommendations on to show significant health be

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from high dose Vitamin C supplementation and good evidence
people on low carb high fat diets don't need as much vitamin C as
carb eaters so I see no need to suffer the possible risk, still only a
correlational risk thus not proven of high dose Vitamin C giving me
a kidney stone. I still think people on a healthy meat based diet
need no supplements

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Janet on April 16, 2018 at 11:21 pm

Thank you so much for this article. I have read that humans lost their ability to make vitamin c, but this, the argument continues, is why we must get vitamin c from foods and that because we were getting it from foods, we stopped needing to make it. It never occurred to me that we stopped making it because WE NO LONGER NEEDED IT. This makes much more sense!!

[Reply](#)

Colorado Old Guy on May 17, 2018 at 6:30 pm

We need vitamin C in proportion to the carbohydrates we eat. This is pretty natural since many fruits and vegetables are high in vitamin c.

Tropical environments have huge amounts of vitamin c in the fruits. Nordic environments don't.

We don't need to get too anal about what we eat as long as it's natural.

Processed carbs are poison. Processed grain oils are as well.

I eat meat fruits and veggies. They're all good.

[Reply](#)

James LaMotte on April 14, 2020 at 7:15 am

My grandmother's people, the Blood tribe of the Blackfoot Nation in Alberta, Canada and Montana, USA, ate almost nothing but meat—primarily bison and elk—and lived long, healthy lives. Early white explorers often remarked that the Blackfoot and Crow peoples of the Upper Missouri were the most robust and handsome people on the continent—tall, stro

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well-shaped. Nowadays, of course, the Blackfoot tribes, like most other American Indians, are in pretty poor shape. Obesity and diabetes are killing more Indians now than we lost in all our many wars. We are being destroyed by potato chips and Twinkies. We need to get back to our old diet and away from this deadly carb-fest.

[Reply](#)

Paul Mabry MD on April 30, 2020 at 1:27 pm

I lived in Albuquerque, NM for 2 years and I saw the same thing happening to the indigenous population there. They have one of the highest consumption rates of sugared beverages in the nation probably because coke and pepsi markets heavily and 30% of that population lacks running water so they just grab cases of coke at the store.

[Reply](#)

James LaMotte on April 15, 2020 at 6:25 pm

Okay, I've submitted THREE comments and NONE have been posted. What's up, Bosco?

[Reply](#)

Paul Mabry MD on April 30, 2020 at 1:28 pm

Sorry I missed this, not sure why I didn't get an alert email, I will check into it.

[Reply](#)

RG White on January 12, 2022 at 11:02 pm

Your research is good, except please note that Wikipedia is quite corrupt and it was very disappointing that you used false info from there.

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Paul Mabry MD on April 6, 2022 at 3:05 am

Anything we humans do is inherently imperfect, but it is possible to find useful information on Wikipedia as 95% of the people who contribute are honestly trying to put up the latest unbiased information. Of course there is that other 5% that try to sway the information to their own personal worldview sometimes you do need to read between the lines.

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