

**EPISODE 251**

[INTRODUCTION]

**[00:00:19] AVH:** Hey everybody, welcome to the podcast. I'm your host Ashleigh VanHouten. I hope you're doing great. We are in February now, so 2019 is chugging right along. I hope that you are enjoying it so far and since it's February, I guess that means that our February March issue of Paleo Magazine is out.

You may have noticed that the cover is you know, a little provocative this time around. It's like I think the title of the cover story is something about, "can eating meat save the planet," which we actually talked about on the podcast a couple of episodes ago. If you want to check that one out and talk about that cover story. I think that's episode 249 so definitely go back and check that out and get the issue because it's a good one.

You might also notice that we did a little bit of a rebrand to the logo, the paleo logo, we kind of brought it and made it a little bit more modern, evolving as we do and let us know what you think. If you like the new logo, if you like the new cover, if you like this issue, we want to start a conversation, we want to hear from you good and constructive.

Constructive criticism is good, we get better from that so send us a message. You can talk to us on social media, on all channels @paleomagazine, you can always reach out to me directly on Instagram @themusclemaven. I love to hear from you. Yeah, that's it.

**[0:01:41.5]** So today, I'm going to read you another research article from our website, this is on an exclusive content but this is another kind of controversial debate type piece but it's also very well researched and thorough, the title is *Does Recent TMAO Research Suggest That the Paleo Diet Causes Heart Disease?* and it was written by Erin Skinner. She is a long time contributor to Paleo Magazine, she's a registered dietitian and author with the passion for helping people revolutionize their health.

She's a certified practitioner in integrative and functional nutrition who uses ancestral nutrition to treat chronic health conditions. This article, I highly recommend you go to the website and

actually read this. Not only because it's a long and pretty in depth heavy article which I'm pretty proud that I read it without messing up too many times but I do say the word TMAO a lot so I apologize for that but you'll get through it.

Anyway, but the article when you go to it on paleomagazine.com, it has a ton of links to other research articles, other studies and things like that. If you're interested in this debate, in this information, you'll get a lot more if you actually go to the website and I say that because the website is also just full of information in general, we've been working really hard on updating it and putting a lot of quality info there for you.

For anyone, you don't have to subscribe, you don't have to be a member of you know, our e-newsletter or anything like that. Although, it does help. If you subscribe, you get even more content but you can go on there every week and check out new recipes that are online only.

**[0:03:23.3]** Research articles like this, we have, at [paleomagazine.com/giveaways](http://paleomagazine.com/giveaways). Every week, we're doing giveaways like you don't have to do anything other than I think maybe put in an email address and we're giving away stuff like cookbooks every week so website's a good place, just to check, just add it to your roster of informative websites that you check out every week because it's worthwhile. Without further ado, I'm going to read this super intense article for you. I hope that you get something out of it.

[SPONSOR MESSAGE]

**[0:03:52.3] AVH:** First though, I'm just going to tell you a little bit about our show sponsor, Elixinol. All right, Elixinol is a company that provides organic hemp oil products with naturally occurring full spectrum CBD and a variety of forms, however you want to try it. They have capsules they have oils, they have lotions and it seems to me like you've heard me talk about CBD before. It seems like there is kind of usually two cant's right? There's like people who immediately are like, what is this new fad? It's snake oil and they roll their eyes and move on and then there's people who are like, what's this new thing and it sounds good, I'm going to try it, it's amazing.

You can – it's okay to be in the middle, right? It's okay to be like cautiously skeptical about CBD and its benefits because I was when I first started and I had to experiment and do some research and try some different companies and really play with it before I found the dosing and the way that it worked best for me.

When I did figure it out, I really noticed some sort of long standing, pretty significant improvements in my health, in the quality of my sleep, in my mood, all of these things. I think it's worth at least doing more research and checking it out and Elixinol is a good place to start because they are really committed to the highest quality sourcing and transparency of where their products are coming from and how they're processed.

They do pharmaceutical grade testing that you know that what you're ordering is actually what you're getting. That is an issue in the supplement industry. I think that it's important that they are taking those steps. I have played with a couple of their products, they have a CBD in capsule form and then they have this thing, it's called a light the zone products.

I think it's basically just fat based like it's in oil. It seems apparently, CBD is better absorbed if the presence of fat, which isn't a problem for me because I'm basically all this eating some kind of fat but anyway. I've tried both of those products and I've had good results from them. I'm going to continue to use them, I've only been using them for like a couple of weeks. I'm going to continue to use it and revert back but it does use full spectrum hemp extract rather than a CBD isolate which if you do your research.

Yeah, it shows that tends to be a more effective product and really, I just feel like there's kind of no way to lose, right? You try it and if it doesn't work out, if it doesn't kind of change your life thing, you know we're soft than if you hadn't tried it. You can reach out to those guys and go to Elixinol.com and ask some questions and check them out on social media, they're super helpful and I actually interviewed a director at Elixinol, his name is Chris Husong and that interview is going to be coming up very soon so I'll let you know so you can learn more about the details and about the products to him directly.

But, if you are interested and you want to give these things a shot, you can go to elixinol.com and use the code paleo mag at checkout, you'll get 10% off the products and if you're willing to

give it a shot, I would love to hear what you think after you've incorporated some CBD into your routine for a little while.

I'm just fascinated with it and it's made such a big difference in my life in a lot of people in my life that I care about. I think that it's worth giving it a shot. Elixinol.com, code, paleo mag, 10% off and here's the interview.

[ARTICLE]

**[0:07:12.8] AVH:** *Does Recent TMAO Research Suggest That the Paleo Diet Causes Heart Disease?* by Erin Skinner. Detractors of the Paleo diet often mention how it may increase a molecule called trimethylamine N-oxide, or TMAO, which has been correlated with disease states. Proponents of a vegan diet use TMAO as rationale for avoiding animal protein, like Dr. Joel Kahn did recently during a highly publicized debate with Paleo advocate Chris Kresser.

In recent weeks, unpublished data from a group of researchers in Australia has received media attention for correlating increased TMAO with the Paleo diet. The researchers suggest that, because TMAO is correlated with cardiovascular disease, the Paleo diet therefore increases risk of cardiovascular disease. The author cites low fiber intake due to the avoidance of whole grains as the reason behind elevated TMAO in the study's "Paleo" subjects.

There's a lot to unpack here to get to the truth of the matter, but let's first start with what TMAO is. It's a molecule produced by gut bacteria using choline, betaine, and carnitine, all of which come primarily from animal sources. It makes sense then that foods known to increase TMAO levels include red meat, eggs, and fish.

In addition to diet and microbiome composition, TMAO levels are also determined by kidney and liver function—and by genetics. Over the last several years, beginning with a 2013 article in the *New England Journal of Medicine*, TMAO has been linked with increased risk of cardiovascular disease. If higher TMAO increases risk of heart disease, then animal protein causes heart attacks, right? Not so fast.

**[0:08:44.4]** There are two primary reasons TMAO and animal proteins are not a concern. Additionally, examining this TMAO research helps inform the best way to implement a Paleo diet. The first reason not to fear TMAO is that it has not definitively been shown to cause cardiovascular disease or any other medical problem. It has simply been correlated with cardiovascular disease and a variety of other medical conditions such as insulin resistance, diabetes, cancer, neurological conditions, and renal disease. Put another way, people who have these medical conditions are more likely to also have high TMAO. But that doesn't mean that TMAO caused the medical problem.

In fact, the opposite could be true: Poor diet and health disrupts the microbiome, elevating TMAO, while at the same time, separately, the same poor lifestyle also leads to medical problems. Correlation we must always remember, does not equal causation. In fact, an October 2018 review article in *Nutrients* concluded, "It is questioned whether TMAO is the mediator of or a bystander in the disease process." Two other recent review articles concluded, "The implication that TMAO itself is a causative factor for cardiovascular and other diseases is controversial," and, "The mechanism by which TMAO promotes atherosclerosis also remains speculative."

The case isn't as open and shut as vegan advocates would suggest. One major argument against the blaming TMAO is the fact that the richest dietary source of TMAO is fish. Consuming fish is firmly associated with a reduction in the incidence of cardiovascular disease. If fish is both cardio-protective and the highest dietary source of TMAO, how can TMAO increase the risk of cardiovascular disease?

Another flaw in the argument that TMAO causes heart disease is the fact that diets high in resistant starch increase TMAO levels. Resistant starch sources, such as fruits, vegetables, and whole grains, are known to be protective against heart disease. If healthy dietary fiber increases TMAO, it doesn't follow that TMAO increases risk of heart disease.

**[0:10:43.4]** TMAO also has a U-shaped association with mortality: higher TMAO is associated with greater risk of death, but low levels is also associated with greater risk of death. Some studies haven't even shown a correlation between TMAO and heart disease. One study of 339 patients found that TMAO was higher in patients with insulin resistance, but that the elevated

TMAO was not associated with a history of heart attack, coronary heart disease, or any cardiovascular event during the following eight years.

Another study found no correlation between elevated TMAO and known heart disease risk markers CRP and LDL cholesterol. In another example, a study of patients with existing cardiovascular disease showed that those with atherosclerosis, hardened/narrowed arteries, did not have elevated TMAO levels. In fact, this group with heart disease had overall decreased levels of TMAO.

Not only is the correlation between TMAO and heart disease poor, but interventional studies have failed to show a mechanism. In one, scientists used L-carnitine supplementation to increase TMAO in patients. This increased TMAO did not induce any markers of atherosclerosis in healthy aged women. No lipid profile changes or other markers of adverse cardiovascular events were detected in these women over 24 weeks.

In another example, carnitine supplementation increased TMAO levels but decreased markers of vascular injury in patients undergoing hemodialysis. Thus, carnitine supplementation, which elevates TMAO is recommended as cardioprotective for these patients. In fact, carnitine a TMAO producer has been shown by other studies to be helpful for treatment of cardiovascular disease.

**[0:12:23.9]** The same lack of causation exists in other areas of TMAO research. For example, TMAO is correlated with insulin resistance as well as type 2 and gestational diabetes. Although more TMAO is produced by the microbiome in people who are obese and insulin resistant, there is no proof that the TMAO itself is dangerous. The lifestyle that leads to metabolic syndrome is obviously dangerous, though, and increased TMAO production could be a marker of this condition.

In a 2016 review article, scientists concluded that “It is possible that accumulation of TMAO in humans in disease state may be an adaptation of cells to stress and, hence, a marker rather than a mediator of disease.” The second primary reason not to fear animal protein is that long term TMAO elevation is known to be caused by dysbiosis, an imbalance of microbiome not by a

serving of animal protein. When gut bacteria is imbalanced, it will produce more TMAO on an ongoing basis.

Dr. Angela Genoni, who led the recent Australian study correlating the Paleo diet with increased TMAO, told Paleo Magazine that the TMAO in fish is not a concern. She's worried about the chronic TMAO elevation resulting from the dysbiosis caused by a low-fiber diet. So a transient TMAO increase caused by a nutrient-rich food is not the issue. This is supported by many longevity studies that correlate fish consumption with long lifespan.

As an analogy, think of candy. An occasional piece of candy is not a big deal. If you eat candy for every meal and snack, however, you're in big trouble, one reason being that consistent sugar intake will cause microbiome dysbiosis. So even if TMAO were dangerous, the critical focus should be on improving gut health, not the transient TMAO increases caused by meals.

Avoiding dysbiosis is critical. The primary controllable cause of dysbiosis is poor diet and lifestyle. This could explain why studies sometimes find a correlation between TMAO and a myriad of medical problems, heart disease, diabetes, neurological disease, cancer, and renal disease. Poor diet and lifestyle cause these diseases; poor diet and lifestyle also cause dysbiosis. Then dysbiosis, in turn, elevates TMAO, which is the bystander or marker, not the cause.

**[0:14:33.0]** In other words, it's not the beef in the burger that's the problem. The problem is the white bun, the fries cooked in hydrogenated oils, and the sugar-sweetened soda likely to come with the beef. A sedentary lifestyle, poor sleep, and high stress levels also contribute to dysbiosis.

Overall, the TMAO research clarifies the picture of the best way to implement a Paleo diet. The link between dysbiosis and lifestyle-related disease demonstrates that feeding the microbiome is critical to health. The primary dietary way that we support our microbiome is by consuming sufficient quantities of dietary fiber and by avoiding foods that harm gut bacteria.

In reporting on the new yet unpublished data criticizing the Paleo diet, the argument has been made that people who follow a Paleo diet long-term for more than a year have elevations of

TMAO and thus consume too little fiber. The suggestion is that the Paleo diet is, therefore, unhealthy because it excludes whole grains. This reasoning is clearly false.

Paleo is not an inherently low-carbohydrate or low-fiber diet. In fact, most ancestral populations have a seasonal variation between high and low-carb/fiber intake. Many ancestral populations actually eat high amounts of fiber some over 100 grams per day. On the other hand, western populations where “whole grains” are emphasized average about half of the minimum fiber recommendations, which is 25 grams for women and 38 grams for men, consuming about 15 grams per day. When properly implemented, the Paleo diet is much more protective against dysbiosis and disease than modern diets when it comes to fiber intake.

**[0:16:01.0]** Some people who follow the Paleo diet, however, do stay on long-term low-carbohydrate or even ketogenic versions of the diet. This way of eating could pose a risk of dysbiosis and possible resulting disease. This recent TMAO research may be a cautionary tale: long-term low-carbohydrate intake may not be safe unless extreme caution is taken.

The ancestral model is to introduce seasonal variation of carbohydrate intake sometimes low and sometimes high. The important thing is to ensure consumption of pre- and probiotic foods—from vegetables, fruits, nuts, seeds, and fermented foods. When carbohydrate intake is low, sufficient consumption of these foods is more challenging to achieve. Getting enough fiber on a low-carbohydrate diet is possible, but it takes deliberate effort.

When dietary carbohydrate and fiber is not well tolerated, it's important to reach out to a trained healthcare professional to improve tolerance to the degree that the microbiome can be supported with sufficient fiber. You don't have to fear your fish fillet, eggs, or even your steak. Eating quality meat is always key but TMAO from animal protein is not a serious risk. The real lessons here are to take extreme caution to ensure sufficient dietary fiber intake from Paleo-friendly sources, and to reach out for help if you need it.

[END OF ARTICLE]

**[0:17:17.6] AVH:** All right guys, I hope you enjoyed this episode. I hope that that taught you a couple of things and now, you have some more discussion points for when your friends or family

members come over and tell you that that whole paleo thing is going to kill you. You have a little bit more of a deeper understanding. So I hope that was helpful.

Thank you again to our sponsors Elixinol. If you want to try any of their high quality full spectrum hemp derived CBD products for general health or muscle recovery or improved sleep, any of a host of other reasons you might want to try CBD, you can head to [elixinol.com](http://elixinol.com) and use the code "paleo mag" at check out for a 10% discount and I hope you do because I think that it could be helpful and it's worth a shot. So thank you to Elixinol.

And next week, do not miss this episode next week. I am interviewing Cal Newport, who is the very famous author of the book, *Deep Work* and he has a new book out called *Digital Minimalism* which I just finished reading and it's really, really good. You might think based on the title that this is just a book saying social media is the worst and it is killing us all and we need to turn it off which is kind of true in a lot of ways let's be real but there's so much more to this book.

It is a really, really accessible clear discussion on the concepts of solitude, of uninterrupted time with your own thoughts of mindful attention to how we use technology. It's just really, really useful empowering relevant book and I am so, so excited to talk to him and I think it's going to be a really valuable interview and I am so glad that I got the opportunity to have that chat with him.

So please make sure you're subscribed to Paleo Magazine Radio on iTunes so that you don't miss out when it is going to be one of the highlights I think of my podcasting career so far. So make sure that you check it out next week and if you are liking the podcast, if you like me, if you like listening to this show every week, I hope you do, if you're here I mean I figure you do, please leave a nice rating and review on iTunes so that I can keep doing this job because I need a job guys so help me out.

All right, that's it for this week. I hope you join me next week and have a great day.

[OUTRO]

**[0:19:34.8] AV:** The intro music for Paleo Magazine Radio is a song called Stronger performed by Alter Ego and I hope you love it.

[END]