



## **Transcript of “A Non-Bulletproof View of Sweeteners with James Krieger”**

Bulletproof Radio podcast #15



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Co-host: Today's cool fact of the day is that your body can store several weeks' worth of vitamin D at a time. If you're going on a trip, and you don't want to carry around a little bottle of vitamin D supplements, you can take several times your normal dose and be set for a few days. It's perfectly safe to take fifty thousand IUs of vitamin D once a week, instead of taking it every day.

You're listening to episode fourteen of upgrade to self radio, with Dave from the Bulletproof Executive Blog.

Today, we have James Krieger with us. He runs a blog debunking health myths called the Health Sleuth. He has a master's degree in nutrition from the University of Florida, and a second master's degree in exercise science from Washington State.

He's a former research director for the Corporate Weight Management program that treated over four hundred people per year, with an average weight loss of forty pounds in three months. His former weight loss clients include the founder of Sylvan Learning Centers and the Little Gym, the vice president from COSTCO, and a former vice president of MSN, which is Microsoft's online arm. He's given over seventy-five lectures on weight loss related topics to physicians, dieticians, and other professionals.

In addition, he's authored five peer reviewed studies for the American Journal of Clinical Nutrition and the Journal of Applied Physiology.

He joins us today on upgraded self radio, specifically to talk about artificial sweeteners, colors, and preservatives, and how they may or may not be affecting your health.

He's, also, one of those guys, I would say, who is a relative supporter of artificial sweeteners. You'll hear some counterpoints to some of the advice that I believe is most optimal around healthy sweeteners and around unhealthy sweeteners.

James has done a lot of statistical research looking at existing reports for artificial sweeteners and looks at determining their safety. We

discussed them at length, and I think that you'll hear during the report that there are some that are higher risk than others, and in James' case, he believes that most of these sweeteners are not harmful. I think he and I are going to agree to disagree on this, but I think you'll learn some things from this interview, and I'm very excited that he was on the show.

How did you get interested in fat loss and nutrition in the first place?  
How did you get going in this?

James: It actually started quite a long time ago. I had started school at the University of Washington, and I was actually planning to go into computer science, but I started weight training and everything, because I was a pretty skinny guy in high school. I really got fascinated by how my body was transforming and everything, so I really started to get, at the time, into the science of building muscle and all that type of thing.

My interest grew more and more in those terms. Then it turned out I wasn't able to get into the computer science department at University of Washington. It was pretty hard to get in. They only take like thirty out of a hundred and twenty people or so at the time.

I transferred to Washington State University. I had a friend who was in the exercise science department at Washington State University, but I first went into computer science over at Washington State. I was just losing interest in the computer science field, and gaining more interest in the exercise field. My friend noticed how passionate I was about it, and he said, "I think you should do exercise science," and at the time I thought, "No. I don't know what I would do with an exercise science degree. I think I'll just ... I'm just going to stick with my path."

But as time went on, I just disliked computer science more and more, and I just decided, "If I'm going to make a change, I should do it now." I only had a year left on my computer science degree, but I ended up totally changing my major to exercise science, and got more and more into the ... interested in the fat loss perspective.

What really got me interested in the fat loss perspective eventually was I got my degree in exercise science at Washington State, and then I went down to University of Florida and got my degree down there. When I came back, I started working for a program called 20/20 Lifestyles. The original thought was ... because I was a PhD student in nutrition down in Florida, and it wasn't really working out for me down there, so I actually finished with a second master's degree, and I moved back up here, and I decided, "Well, I'll just work for a year. Reestablish my residency in the state, and then I'll finish my PhD at University of Washington in nutrition."

I took a job just as a personal trainer at ... It's called the Pro Sports Club. It's actually one of the largest health clubs in the world. Most of their clientele are Microsoft employees, because Microsoft subsidizes a membership.

I started as a personal trainer there, but the CEO there kind of took notice of me, my background and everything. He goes, "We've got this big weight loss program called 20/20 Lifestyles, and I'd really ... I want a person who will do research and things." They actually hired me into that position, and I did that for four or five years. Then I really got into the weight loss aspect of it, because that was my job. I did literature reviews for the staff, because we had physicians and dieticians on the staff, and so I'd do literature reviews. I would do some ... I'd look at the data on our own clients. I did ... Half of my job was digging up pub med research, and reading research and everything.

I actually never went back to finish my PhD, because I was basically doing what I wanted to do.

That's how I really got into the weight loss aspect of things.

Co-host: It's pretty funny the background there with computer science and cutting over. I call myself a biohacker, and I did the computer science and the computer information systems thing, and, at the same time, I weighed three hundred pounds. I just said, "Look, if I can hack a really complex internet architecture, and figure out how things work on

multiple levels, I need to do this for myself, because my doctor sure as heck isn't."

This was fifteen years ago, but the amount of research and just systems thinking that goes into it, and all of a sudden, this is actually kind of fun. In fact, it's more interesting than some computer science problems by a long shot.

It's neat to hear that you did three quarters of a computer science program to learn the systems thinking, which I think goes really great along with things like pub med that let you look at how biology works.

James: Yeah, yeah.

Co-host: One of your areas of interest is artificial sweeteners, and it's one of mine as well. Are they as bad as many people think?

James: I'm of the opinion of no, and the reason is if you really look at the science and them, and you take ... Because you go on the internet and there's all kinds of scare stories about artificial sweeteners and everything, but the problem with those stories is, number one, anecdotes are not necessarily reliable scientific evidence, because the thing is let's say I eat a food with an artificial sweetener in it. I get some type of sickness or whatever. You can't necessarily attribute that to the artificial sweetener, because correlation does not equal causation, and it could be a myriad of other things. I mean that's why we have experimental research to determine what type of things truly are causal.

I mean there's a vast amount of data out there on artificial sweeteners, both animal data and human data. When you really look at the research as a whole, when they're consumed in amounts that are basically under what is called the adequate daily intake, or ADI, as long as you don't exceed the ADI, they're perfectly safe for the vast majority of people.

Now, there may be very, very small percentages of people who may be sensitive under certain circumstances, but when you look at the vast majority of people, and as long as you consume it under the ADI, the vast majority of evidence indicates they're safe.

Another thing about the ADI is, what a lot of people don't realize about the ADI is there's actually a one hundred fold safety factor built into the ADI. The way they establish the ADI for any type of substance, whether it's an artificial sweetener or anything else, any type of thing that's put in food, basically what they do is they take the maximum dose that's been found to not cause any side effects in animals, and that's called the no observed adverse event, or effect level, NOAEL. They take that amount, and they divide it by a hundred, and then that's what they establish as what the maximum dose for humans would be that would be considered safe. Obviously, there's a hundred fold safety factor built into that.

That ADI is basically if you were to consume that maximum amount every day for the rest of your life, which most people don't do.

When you look at epidemiological ... or I shouldn't say epidemiological data, observational data on the intake of artificial sweeteners for most people, most people don't even come close to exceeding the ADI. There's been a few papers that suggested under certain circumstances in certain countries a few people might exceed the ADI, but most people don't even come close.

The amount ... I actually wrote in an article here ... I'd have to see if I can find it. But it gave the amount of, for example, a diet soda, the amount of cans of diet soda you would have to drink to exceed the ADI for certain sweeteners, and I don't know the numbers off the top of my head, but it was like you'd have to drink twenty or thirty cans of soda, diet soda a day, which a few people do.

I mean in the weight management program that he had ... I mean the thing is, again, most of our clients were Microsoft employees, and one of the things Microsoft does is they give out free soda and drinks to their employees. I mean there's basically in every building, just down the hallway, there will be a soda dispenser ... or not a dispenser, but basically it's a little refrigerator. You can pull just cans out. My wife did a contract job at Microsoft for three months, and I mean it was just these things were everywhere.

Sometimes we'd have a few clients that would come into our program, and, yeah, they were drinking like twenty cans of soda a day. There are people that do that, but that's obviously the exception rather than the rule. Most people don't go to that excess.

That's my long winded answer to your question.

Co-host: Why do you think it is that artificial sweeteners have gotten such a horrible reputation? Is it just from the stories on the internet, or are there anecdotal accounts that might reflect maybe a personal sensitivity to these compounds?

James: I think it's more just the stories on the internet. It's not just artificial sweeteners. Basically a lot of people have ... this whole idea of something that's artificial or a chemical in a sense. I mean basically everything is a chemical. All foods are chemicals. I think it's this ... Some people, not everybody, but some people have this mentality that somehow things that are natural are better for you, and that anything that is quote, unquote, artificial, must have some type of adverse health effect, simply because it's manmade, or it's ... I think it can be an emotional gut reaction that some people have, and it may even ... Some people just have a certain world view that natural is better, and so I think it kind of plays along those lines.

I think it, also ... Let's say somebody gets cancer or something like that. We all want something to blame. I think sometimes given the prevalence of artificial sweeteners in foods and everything, I think that they can make a really good scapegoat, and people want to point the finger.

There are documented sensitivities to certain sweeteners, but, again, they're very, very rare. For example, there's been some case reports of headaches with aspartame.

Co-host: I was going to ask you just a quick question about that. Aspartame is one of those things where seventy-five percent of adverse reactions to food additives that get reported to the FDA are from aspartame, and headache is the number one symptom of that. I mean you're saying



some people, but it seems like they get more about this than they do from E-coli or anything else.

James: Here's the problem with using the FDA's ... Basically anybody can report anything to the FDA, but the thing is you can't ... Again, you can't necessarily attribute it to the actual sweetener, so it's like if someone eats something and they get a headache, and they think, "I think it might have been the aspartame, and I'll report it to the FDA."

The FDA doesn't actually investigate it further, so when you actually look at the controlled studies ... They've actually done controlled studies on aspartame and headaches.

One study was actually a very well designed study, where it was a double blind study, and they took people ... they recruited people who claimed that they got headaches from aspartame. It was double blind, and they gave them either aspartame or a placebo, and the people reported headaches just as much from the placebo as they did from the aspartame. It wasn't necessarily ... It wasn't aspartame actually causing the headaches.

Now, there have been a few case reports in the literature that some people reported headaches from aspartame use, and then when they obviously eliminated the aspartame from their diet the headaches went away.

There still maybe a little bit of evidence there. It's not very strong evidence that it causes headaches, but, again, that's going to be a minority. If it does cause headaches, it's within a small minority of people. In most people, it's not going to be an issue.

But, yeah, the problem with using the FDA's complaint registrations is that it's not controlled data.

Actually there was a study done where they actually did investigate some of the complaints to the FDA. Where was that? Let's see if I can find this here, because I actually wrong about it on my site. Basically what they did is they took people who had registered complaints to the

FDA, and then they wanted to look at ... They looked at some of these people's behaviors and things, and what they found is that some of the people that reported the headaches from aspartame, it turned out that the headache triggers were actually something else, and it wasn't the aspartame.

That's, again, why the FDA's registration data is not real reliable. It brings up ideas of things that should be investigated, but it's not reliable data in and of itself.

Co-host: Here's how I determine ... I'm one of those guys who really is sensitive to it, and I didn't know it, because I was ... Back when I was maybe twenty, I would ... I'd probably eat fifteen pieces of NutraSweet gum a day, and drink a couple diet sodas, trying to lose weight when I weighed three hundred pounds.

One time I had one of those like forty-two ounce sodas of straight Diet Coke by itself for breakfast, and I sat in class all day long, and I swear I was on a hallucinogen. I had never felt that bad. I ended up waking up in a pool of my own drool on the desk in front of me, and thinking, "I haven't felt this bad in my entire life."

It was the only variable that I changed that morning. I started paying attention to it, and it's to the point where I don't touch the stuff, and if I do touch it without even thinking it's in my food, I get exactly the same symptoms every time.

I would like to ask you your thoughts about you don't really the FDA or any of these trials. Have just a good sized dose of NutraSweet and nothing else and see what happens.

James: Again, I'm not saying that nobody is sensitive to NutraSweet or aspartame, because here's the deal with scientific trials. The thing about scientific trials is given the same sizes in scientific trials, if there is an extremely rare effect, it may not necessarily show up in scientific trials, because there's not enough people to actually detect ... Because basically whenever you're comparing a placebo and anything like aspartame, you're looking for statistically significant differences between groups,

but if you don't have real large sample sizes ... If there's a difference that's very rare or very, very, very small, you won't be able to detect it.

It's very possible that there is a very small percentage of people, and you may be in that very small percentage, that may be very sensitive to it, and I even wrote in my article that ... I said certain ... I even say here actually, there's a sentence in my article, it says, "There is some data that suggests that aspartame might be a migraine trigger in a small percentage of susceptible individuals, but the data here remains inconsistent."

Definitely there may be a small ... I'm certainly not saying that it's not going to cause effects in anybody, because, again, when you're looking at scientific data, and you're dealing with limited sample sizes, there may be rare effects that you maybe can't necessarily detect in a small ... very small number of people.

You could be very well one of those real small percentages, because there are case reports in the literature, and I do talk about some of those case reports and literature in my articles.

It would be up to an individual. Obviously, you're not going to hurt anything by eliminating aspartame in your diet. I mean if you've eliminated it, and it seems like the effects go away, then, yeah. That's great.

Co-host: What do you think about the idea of just testing yourself. I have some people who read the blogs, who are like, "I read the [inaudible 00:19:14] entry on NutraSweet, and I think it must be safe, because I want it to be safe, so I'm going to keep drinking my diet sodas." I tend to find that people don't perform as well cognitively if they're regular diet soda users, for whatever reason, whether it's an insulin effect or something else.

I'm not saying that they're going to necessarily kill you, although I think NutraSweet may be one of the ones I'm most concerned about, but what do you think of the idea of just doing the test yourself. It's not double blinded, obviously. I suppose you could make it double blinded, but just

saying drink the soda and see how you do that morning. I think most people would feel worse on Diet Coke for breakfast compared to a glass of water for breakfast.

James: Yeah. Again, there's nothing wrong with doing that. As you point out though, you're introducing some psychological expectations that may actually influence how you feel.

Co-host: Sure.

James: But the thing is, let's say it is just a placebo effect. Even if it's just a placebo effect, it's like so what? If it's just a placebo effect, if you feel better not taking it, then you feel better not taking it. Again, it's not like a dichotomous situation, where it's like, "Oh, aspartame is safe. Therefore, you should have it." It's more ... What I try to fight again is I just don't like scare mongering or fear mongering. I'm very evidence based, and I'm ... The way I write my articles on my site is I'm very level headed. I just say, "Here. Here's what the scientific evidence says. There may be some people that may be sensitive to aspartame. If you feel you're sensitive, then you don't have to consume it." Yeah, there's nothing wrong with if you limit it in your diet, and if you feel better, then great. There's certainly nothing wrong with doing that.

Co-host: Have you seen any studies on say working memory, or cognitive performance, or athletic performance associated with any of the sweeteners that you've written about?

James: Actually yes. There's been aspartame studies on mood, cognition, and behavior. For example ...

Co-host: What did they show? I'm not familiar with those studies, but I'm thinking there's probably a lot of people who are listening to this who actually do use NutraSweet, so I'd love to hear what, if you remember, off the top of your head, what those studies found.

James: There's one ... Actually I pulled up my aspartame article here, so I'm able to look at what I wrote here. There was some double blind studies on children, including those thought to be sugar sensitive, or with attention

deficit disorder, and they looked at behavior, mood, learning, and, also, plasma, amino acids, and neurotransmitters. They didn't find any effects there.

There's, also, research on adults using doses of up to seventy-four milligrams per kilogram for six months. Have, also, not found any adverse effects on mood or learning.

There was a study ... a double blind, crossover study on depressed patients. Now, that study they reported an increased frequency and severity of adverse experiences in the subjects receiving aspartame. However, the study was flawed, because the researchers numerically combined unrelated adverse effects, which is basically a no no in terms of statistics.

Also, the lead author of that study is a person who is actually ... who has misrepresented a large body of aspartame research. He actually lied about some aspartame studies, and I actually wrote about it in one of my articles. That was one study where I was really iffy about, because of who the lead author was.

They've, also, done studies on people who phenylketonuria. Phenylketonuria is a genetic disorder where you have trouble metabolizing phenylalanine. You'll probably notice, whenever you see a product that contains aspartame, it will say, at least in the US, and I'm not sure what it is in Canada, but in the United States, there will be a warning label that says, "For individuals with PKU, this product contains phenylalanine."

Phenylalanine is a naturally occurring amino acid, but people with ... It's a rare genetic disorder. They have trouble metabolizing that amino acid.

Since aspartame contains phenylalanine, any product that has aspartame has to have that warning label.

They actually did a study on the brain function, brain electrical activity, and plasma, and amino acids in people with phenylketonuria, and they found no effects, no adverse effects at all, and these were people with a

genetic disorder, where they actually have trouble metabolizing phenylalanine.

When you look at the vast majority of research, there does not appear to be effects on mood, cognition, or behavior.

Again, though, as I stated before, you can't rule out a very rare effect, again, given the sample sizes of these studies. There could be some very, very rare effect that happens in a very small percentage of people that these studies just can't detect, because of the limitations of statistics.

Co-host: Yeah. That's a concern of mine with a lot of the studies. Some of them aren't long enough, and just because some of the effects, if they take a while, then you're just not going to cover a ten year chronic usage effect in a typical study. No one is going to fund that, and it's just not really doable, so you have to resort to epidemiological evidence.

Then there's the whole ... I'm not as hyper [inaudible 00:24:33] as well as I would have been if I didn't do this kind of thing. My particular fetish there is around how do I maximize cognitive performance and memory, and personal performance kind of on all levels, so you can have the energy to do what you want, whether it's go walking in the Himalayas, or extra time with the kids after a long day at work, whatever it is, but just to be able to be more intense when you need to be.

I'll tell you, I'm still very skeptical that NutraSweet is a health food, and I think that the risks of taking it are higher than the risks of not taking it, because there's no risk for not taking it. I do know there's a lot of controversy about it, and from a personal biohacking perspective, I would encourage anyone listening to this show to give it a try. I mean if you think it's really bad, or you think it's really good, eliminate every other variable you can. Have a large dose, and see how you do, and then do that some other day with just water, or have a friend do it with regular Coke versus Diet Coke. See what the difference is. You might be surprised. You might not be surprised.

Tell us about the history of some of the other common sweeteners, other than NutraSweet, which we sort of zoomed in on there, or other

than aspartame, like neotame, or sucralose, or acesulfame potassium. What's your take there?

James: Again, my take is they're safe for the vast majority of people. Neotame is basically ... is very similar to aspartame. It's basically ... It's just like aspartame. It's made up of two amino acids, phenylalanine and aspartic acid. It's just that the bond between the two are stronger than aspartame. Neotame is ... That's why it's better for baked goods, because it won't break down like aspartame will.

Basically, other than that, neotame is pretty much identical to aspartame for the most part.

Sucralose is basically an isomer of a sugar and the thing about sucralose, basically your body can't metabolize it, so what happens with sucralose is it basically just passes right through you unmetabolized.

Then there's acesulfame potassium. Same thing. Again, there's an ADI ... I mean all these products have ADIs, that type of thing, and, again, the vast majority of evidence indicates that sucralose is safe, again, in the vast majority of people.

But, again, you can't rule out that there may be a very small percentage of people who may have sensitivity.

Then there's saccharine, and saccharine kind of got a bad rap for a while, because saccharine actually became the big sweetener in the 1970s, and something that got a bad rap for a while, because there were some studies done on rats, and a few of the studies found an increased risk of bladder cancer. Suddenly, all these products that contained saccharine would carry a warning label, and it would say use of this product may be hazardous to your health. This product contains saccharine, which has been determined to cause cancer in laboratory animals.

What actually happens, the National Institute for Environmental Health put saccharine on its potential carcinogen list. The International Agency

for Research on Cancer, also, labeled saccharine as potentially carcinogenic.

However, the National Institute for Environmental Health Sciences eventually reversed its position on saccharine, and removed it from the potential carcinogen list, and, also, these warning labels were removed, and the reason was it was discovered that the cancer causing mechanism in rats actually did not apply to humans. That was the first reason.

The second reason was they needed an extremely high dose to see the effect in rats, a dose much higher than a human would ever actually consume. It's, also, been found that vitamin C will actually ... when fed at similar doses will cause bladder cancer in rates.

Really what it comes down to is rodents are very susceptible to bladder cancer when you have any type of sodium salt, whether it's sodium ascorbate, which is vitamin C, or sodium saccharine, or anything. You give them a high enough dose and they'll get bladder cancer, because it actually has to do with the sodium salts themselves, and not the thing.

In 1999, the IRAC actually downgraded saccharine from possibly carcinogenic in humans, to not classifiable as a carcinogen in humans.

In 2000, the requirement for warning labels was removed in the United States. Actually in Europe, saccharine never has been prohibited, and it was never required to have warning labels. Actually Canada is considering lifting its ban on saccharine as a food additive.

Co-host: I can tell you. I would choose saccharine over a lot of the more modern less tested sweeteners, just in terms of health risks, but I would probably just use xylitol or erythritol, which have far fewer risks and probably health benefits compared to anything that's on the list here.

What do you think about those guys?

James: For the sugar alcohols, like xylitol and everything, the only issue with the sugar is alcohols is if you consume too much you can get diarrhea and things like that, because they can attract water into your intestine



and everything. There are reported side effects above a certain dose, and I would have to ... I don't remember what those doses were.

Actually, it's funny that you brought up sugar alcohols, because I did an entire presentation on sugar alcohols, too. When I worked for 20/20 Lifestyles I did a whole ... because the dietitians were thinking the same thing. They were like, "Well, what about sugar alcohols? Can you do some research on sugar alcohols for us?"

I did this big, long literature review. Went through all the research on sugar alcohols, and, yeah, sugar alcohols, perfectly safe in certain doses, but, again, you get above a certain threshold dose for some of them, and you can have gastrointestinal side effects, like diarrhea and things.

Co-host: Most definitely. I have to warn my wife occasionally, but we mostly use xylitol and erythritol. We have two young kids. Once you're acclimated, once your body learns to make the enzymes, like [xylin 00:30:56] has to break down xylitol, you don't have that problem anymore, but if you bake a bunch of xylitol cupcakes, and you don't warn people who eat them, there will be a line at the bathroom, and that's not so nice.

It's a question of dosage, for sure, for people who've never had it, but most people can have a few teaspoons.

Let's talk about acesulfame potassium, which is, in my mind, the most realistic tasting fake sweetener I've ever found. I used to eat a lot of this stuff when I was working on losing weight, a lot, before I figured out a different path.

I actually got diagnosed with having benign thyroid growths by a physician in the Bay area. Actually not even an alternative physician, just the standard kind of western doctor. I did some looking around, and found, "Oh, wait. This is like my number one sweetener, and it appears to be tied to this."

When I dug in on that, I mean there's a whole bunch of pretty high end government science people who are saying things like there are lots of serious flaws in the design and conduct of the tests around acesulfame

potassium, and this is a physician who is the former director from the International Agency for Research on Cancer in the WHO. He's like this is spread all over [inaudible 00:32:12] quote. A whole bunch of things like that, where they're saying, "Look, the research behind this one is really ... there's just not enough, and what we do see has some cancer concerns."

Did you not find this when you looked at acesulfame potassium?

James: Actually I did address those issues.

Co-host: Oh, you did. Okay.

James: What you're referring to is ... there was some cancer studies done in 1970s whether ASK might cause cancer, and those studies were criticized. Some of the criticism included they said that the randomization of test groups were not carried out properly. The mice were held on test for only eighty weeks, not the one hundred four weeks, which is characteristic of national toxicology program studies.

There were, also, claims that the monitoring of animals was very poor. That there were high disease rates, and extensive cell destruction of tissues.

Now, there's been disagreement over that. The European Scientific Committee on Food, the European SCF, they disagreed with those criticisms. They stated that all the 1970 studies, other than one, were adequate to be used for safety evaluation, and that one study was ultimately dismissed by both the Food and Drug Administration and SCF. It was a one hundred and four week study.

In that study, the researchers observed higher death rates in the rats fed ASK, compared to the controls. Higher death rates were found in the males fed a diet of one and three percent ASK. Females fed a diet point three percent ASK.

However, the death rates were in the normal range for the rat strain, and the death rate in the control group was abnormally low. The incidence of lung tumors was high in the group getting the highest dose,

and there was some evidence that the tumors appeared earlier. However, this type of tumor was a common cause of death in this particular rate strain, and the frequency of tumors was still within the normal range. These results were likely the consequence of a respiratory disease, rather than the ASK, and that's why the FDA and the SCF basically ended up dismissing that study.

Of the studies they did find adequate, they found no increase in mortality or tumor incidence.

Now, the National Toxicology Program did follow up with a study on genetically modified mice in 2005. These were mice that are more susceptible to getting cancer, because they possess genes that predispose them to getting cancer, and they, also, lack genes that help suppress tumors. There was actually no cancer causing effects seen in this study, despite the fact that these animals were actually more susceptible to getting cancer.

Again, there has been some criticism there, because that transgenic model system hasn't been validated yet as a lone cancer study. ASK was twice nominated in 1996 and 2006 for the National Toxicology Program standard cancer studies, but the NTP rejected both nominations.

I do address the criticisms of some of the ASK data. My summary was the vast majority of evidence indicates it's safe when consumed at amounts below the ADI, and I, also, want to preface that. I mean we're talking about amounts below the ADI. If you're consuming really, really large amounts of this stuff, which you might be if you're someone who goes on a diet, and they're just consuming diet products all day, I mean they might be consuming more than the ADI.

But if you're consuming amounts lower than the ADI, most evidence indicates ... or the majority of evidence indicates it's safe. There have been some questions about the quality of the long term cancer studies, but the bulk of the evidence currently indicates there is no cancer causing effect.

Because ASK has not been on the market as long as sweeteners like aspartame, there is no epidemiological data to confirm the lack of cancer causing effect in humans. Overall, though, the risk of ASK inducing cancer is negligible, based on current data.

There is some data that suggests that small children may approach that ADI in certain circumstances, so caution is warranted there.

My final sense in my article on ASK was, as I constantly preach in my articles, an approach of moderation is likely best when it comes to sweeteners like ASK.

Again, certainly, there's nothing wrong with eliminating it if it's of concern, but I would try to just take a very level headed look. Here's what the evidence says. Most evidence indicates it's safe, but there is some question marks about the data.

Co-host: James, one of the other really common sweeteners is stevia, and I know a lot of people, as you talked about earlier, say it's better because it's natural. Is it really as good as people say? Is it safe? What is your opinion about stevia?

James: Same thing with stevia. Most of the evidence indicates it's safe.

There were some question marks about stevia originally, because there wasn't a lot of data on it, and there were some concerns based on a few studies that it could cause reproductive toxicity, but more advanced studies ... because there was some concerns about effects on male fertility and things, but those early studies were problematic.

When you look at the better studies and the more recent studies, they don't show any adverse reproductive effects of stevia. Stevia definitely seems to be okay there. There's no evidence of genotoxic effects.

The only issues where Stevia might be a problem, and this is just like artificial sweeteners. There may be a small percentage of people who are sensitive. There are documented people who may have allergies to stevia. There have been case reports of people getting atopic eczema, which is basically scaly and itchy rashes on your skin, from stevia, and

there actually have been a few case reports of people going into anaphylactic shock from getting stevia.

Co-host: Stevia versus NutraSweet, or versus aspartame, which one do you think is a better choice?

James: Again, I don't think one is any better than the other. I think it just comes down to the individual. I really don't think one is any better than the other.

For me, personally, I would do either one, but that's just for me. It comes down to the individual. If somebody has allergies, there's some case reports that people with nasal allergies ... There was one study, sixteen percent of infants with nasal allergies were found to be allergic to stevia. Thirty-four percent of infants with bronchial asthma were found to be allergic to stevia, and, also, sixty-four percent of the infants with atopic eczema were found to be allergic to stevia.

If you're a person with asthma, or nasal allergies, or something like that, you might be better off with aspartame versus stevia, but, again, it comes down to you just have to try it and see, although, again, you want to be careful about ... again, because there have been some case reports of anaphylactic shock with stevia.

Co-host: The point that stevia to a lot of people tastes kind of like socks. It's one of my least favorite sweeteners to be perfectly honest.

James: Yeah. I've never had ... I'm not sure I've ever even had a product with stevia in it, so I'm not familiar with the taste.

The regulatory status of it actually varies dramatically from one country to the next. Currently in the United States, the stevia leaf and extracts were available as dietary supplements, but are not approved for use as a food additive or sweetener. Only rebaudiana a, which is basically a component of stevia, is approved for use as a sweetener. Basically rebaudiana a has been given gras status by the FDA. What gras means is generally regarded as safe, so it has not gone through the stringent testing actually that things like aspartame have gone through.

When you look in Europe, the European Union actually has not approved stevia as a sweetener, although it was expected to do it sometime this year, but I haven't followed up on that, so I don't know if they actually did eventually approve it, or what's been going on with stevia in Europe.

It's been approved in some other countries. France temporarily approved rebaudiana a. It's a two year test. It's currently ongoing.

There are a few countries that have banned stevia. Hong Kong, Singapore, Norway actually have banned stevia.

But, again, most evidence indicates it's safe, but just like with artificial sweeteners, there may be a small percentage of people who may be sensitive, and may actually have allergies to it.

This is really true with any type of food. Whether it's artificial or naturally occurring, there are foods that people have sensitivities to. It doesn't matter whether it's natural or not. It still comes down to an individual decision on what's going to work best for you.

That's why I don't like to make blanket statements about any type of products, whether it's an artificial sweetener or a natural sweetener, like stevia, because it might be fine for most people, but, again, there may be some people where it doesn't really work for them.

It really comes down to the individual, and knowing what's going to work for you, and what makes you feel good.

Co-host: I couldn't agree more. I think having that same thing. If you want to see how stevia works, use it as your sweetener for a while, and look for how you feel, and how you're doing.

The other question there that's along the lines of stevia is Lo Han. Have you come across that at all?

James: No. I've never even heard of Lo Han. That's new to me. I don't have any knowledge on ...

Co-host: It's a new Chinese fruit extract that's three hundred times sweeter than almost anything else out there, but it's, also, solvent extract, just like stevia. I'm a little skeptical of it, but I've been getting a few questions about that from people, and I tend to say if it's been extracted using xylene or toluene, you probably ought not to eat it as a general practice.

Who knows? I haven't seen a lot of studies on that.

James: Yeah. I haven't even heard of that, so I don't have any knowledge on that.

Co-host: In terms of health benefits, like for any of these artificial sweeteners, are there documented things, "Wow. People eat this and they do better than people who don't eat it," or is it just that, "Oh, they probably don't kill you."

James: Stevia's not really an artificial sweetener, but there has been some evidence for stevia that actually ... it actually helps people with diabetes in their blood sugar control.

Co-host: Yeah. I've seen that, too.

James: Yeah. There's been some studies on that.

As far as improving anything, or actually showing some type of health benefit, I mean the only benefit would be ... if someone's able to ... like a diabetic is able to reduce sugar in their diet or something like that. There's no evidence that they're suddenly going to have this health benefit.

When you take a look at aspartame, really all aspartame is ... it's basically two amino acids linked together, aspartic acid and phenylalanine, which are just naturally occurring amino acids in food, and then there's methanol, which is basically like wood alcohol.

When you take aspartame, basically your body breaks in down in those three substances. Some people have raised concern about the methanol, because methanol is very ... it's toxic in very high amounts, but the thing is, you actually get more methanol from fruit juice. We all have

methanol in our diets, because fruits and ... methanol occurs naturally in fruits, and fruit juices, and stuff, and you actually get more methanol from fruit than you ever would from aspartame.

Small amounts, your body can handle methanol no problem. It totally just metabolizes it. You need really high doses of methanol for it to actually be toxic.

As far as any type of health benefit, no. There's not going to be ... it's not going to lower your cholesterol. The only benefit becomes if you're able to eliminate certain foods that do increase your cholesterol and you replace them with an artificially sweetened food, then that would be the quote, unquote, benefit.

Compared to a placebo, aspartame is not going to lower your cholesterol, or it's not going to reduce your blood pressure or something like that.

Co-host: Got it. That was kind of my general assumption. I think that there's no reason to eat artificial sweeteners whatsoever, when you can just eat food that doesn't taste sweet, and have positive effects from the food.

I look at it from very much a broad systems thinking thing, like you're adding another variable that isn't shown to have a positive effect, and could potentially have a negative effect. In terms of simplicity and all, cutting that out is not a bad idea, but if you think you're going to die if it doesn't taste sweet, then maybe you need to do it for your stress.

I eventually eliminated all artificial sweeteners, and just went with sugar alcohols, or straight dextrose in my diet if I'm looking for a little cognitive boost, just from getting my glycogen levels up, because I couldn't find a reason to drink a diet soda, versus a Pellegrino. There was no positive possible thing I could determine there.

It sounds like you haven't seen anything other than if you drink this, it will keep you from drinking something that's even worse, which I would agree with that, too.



Let's move on to another area of actual passion for me. I'm really interested in bacon as a religion actually. Maybe not quite that far. I know that you've done some work on preservatives, and particularly looking at nitrates. What's your take on bacon, on the level of nitrate or nitrite in it. Where do you land on the bacon spectrum?

James: I don't know how much nitrate or nitrites are in bacon, but basically what it comes down to is when you're looking at nitrates and nitrites, nitrates and nitrites, there's really no evidence ... evidence indicates they're perfectly safe.

What a lot of people don't realize is nitrates and nitrites actually are found naturally in vegetables. Yeah. Nitrates and nitrites are not ... because there have been some concerns that they can cause cancer and everything, and really where the concern comes from is these substances can be converted into what are called n-nitroso compounds or nitrosamines, and nitrosamines are definitely are carcinogenic. Some people have thought about could it be the nitrites and nitrates that are responsible for possibly causing cancer and everything.

Again, nitrates and nitrites are found in vegetables, but there's some differences there. For example, when you look at the nitrate in vegetables, you're, also, getting antioxidants in the vegetables, and the antioxidants actually prevent the nitrosamines from forming, so it's not totally ... You're not comparing apples and oranges when you're comparing, for example, nitrates in bacon and vegetables, and the nitrates in ...

Co-host: Actually you probably are, because in the US the requirements for bacon are sixty milligrams of ascorbic acid per kilo in order to block the effects of nitrosamine formation.

James: Yeah. That's true. Basically really what it comes down to is where the issue more comes from. It's not really the nitrates and nitrites themselves. Where the problem can come from is actually when it comes down to more red meats. What's been found is that ... The thing that makes red meat red is the heme iron that's in it.

The thing about heme iron, what has been found is that heme iron will actually increase n-nitroso formation. When you eat red meat, especially a processed red meat like let's say salami, or pepperoni, or something like that ... yeah. When you eat that type of meat, you're actually getting a big elevation of nitrosamines because of the heme iron that's in the meat. Actually they found that when people eat red meat or red processed meats, nitrosamine excretion in the feces increased by up to three times, which is similar to the increase observed with smoking.

When you switch to white meat, it reduces fecal nitrosamine levels. They've actually found a dose dependent effect between red meat and fecal excretion of n-nitroso compounds.

When you look at epidemiological data, you see this association between red and processed meat intake and colon cancer, and the big thing that's really going on there, it's probably because of the heme iron that's in the red and cured meats. It's reacting with nitrates ... It reacts with the nitrates, and then it increased n-nitroso compounds in the diet.

Co-host: I have a question about that. If you're eating cured turkey, those turkey sliced weird things, or reconstituted chicken, like you'd find in a chicken McNugget or something, those are essentially cured chicken products. Are those the sorts of things that are, also, going to cause this problem, because you're basically applying those same chemical processes to the protein that's in white meat, or is cured white meat okay, according to the research you're talking about?

James: I would say the cured white meat is certainly better than the cured red meats. Again, even those cured white meats ... Like you had mentioned, the bacon at least has the sodium ascorbate and stuff in it. Some other cured whites may not have those antioxidants.

It's a tough question there with the cured white meats, because when you look at epidemiological data, it's very tough to ... You can basically look at red meat, you can look at processed meats, but when you try to break it down into different types of processed meats in terms of epidemiology, it becomes hairy statistically.

Co-host: Those variables there that very few people look at, and the one that's almost impossible to do from a broad population perspective is the formation of mycotoxins during curing, and, also, in what the animals ate. That's one of the things that makes it really tough, because this batch of bacon, or this batch of sausage, depending on where it was cured and what the animal ate, may have very different levels of things that form in the curing process that are not nitrate related whatsoever. Some of those molecules, we only learned about how to identify them in 1985. These are basically parts per million effective things. I've got a lecture on the site about that.

I'm very skeptical of almost all cured meats, and I even tell people who are going to eat bacon, which I consider to be healthy if you don't burn it when you cook it, and if you make sure it was cured with vitamin C, and it came from a healthy animal, which is kind of a high bar to pass, but is you do that, you can eat bacon and feel really good, and even experience cognitive benefits from it.

I'm with you there. Most cured meats, whatever color they are, I wouldn't touch with a ten foot pole.

James: Yeah, absolutely. One thing that I recommend to people. When you do consume meats, consume them with fruits and vegetables, because at least then you're getting the antioxidants from the fruit and vegetables that can help reduce the nitrosamine formation.

Co-host: It's good advice. In fact, I would say if you're going to eat meat, take an antioxidant capsule with it. I oftentimes do ... I can't say I always do.

The other trick that I've seen, and I wanted to get your take on this, is that some of the more organic, we'll call it hippie bacon, if there is such a thing, company, are saying, "It's nitrate free," and instead they're using celery powder. Celery would be the highest nitrite form of vegetable that we know of.

They're essentially taking powdered nitrite that came from celery, and saying it's nitrate free. Do you see any harm in that practice of using nitrite from celery versus nitrate?

James: I don't see any harm in it. I don't see why that would be harmful.

Co-host: I don't think so either. I think it's kind of misleading, but it seems safe [crosstalk 00:52:09].

James: Yeah. It probably is misleading, but, yeah, I don't see any harm in it.

Co-host: I put nitrate salt, curing salt on the bacon that I make, so I'm okay with nitrates.

The other thing that I'm curious if you've come across is the role of probiotics in the gut on the formation of nitrosamines inside the digestive process.

James: When I wrote my article on that, I didn't really look into the effects of the bacteria in the gut.

Co-host: It turns out there's pretty good research on that, enough that I recommend take your probiotics, because if you have healthy gut flora, the formation of nitrosamines in the gut goes down dramatically. Or we could use your trick, eat things that are rich in antioxidants when you're going to eat things that may potentially form those harmful compounds.

The paleo crowd follows this podcast, because the bulletproof diet is paleo compliant, but it tries to reduce toxins like mycotoxins, and like nitrous. I means through the recommended nutritional practices there.

Co-host: James, one other question is about other preservatives as well, and colorings and dyes. What do you think about those? Are they similar to the artificial sweeteners we talked about? I know there's some research linking dyes and colorings to things like ADHD and developmental disorders. Do you have any evidence on that?

James: Yeah. I haven't done enough reading in the research in that area, so I'm not real knowledgeable about the studies in that area. But you just gave me a good idea for a topic to look into to write about on my site.

Typically, again, you're going to have, just like you would with artificial sweeteners, there's going to be what's called an ADI, or an adequate

daily intake where there's been no observed adverse effects, up to a certain dose or whatever.

As far as the studies linking the ADHD, I haven't read any of those studies, so I can't really offer an opinion on them, because I haven't actually read any of them, so I don't know what the quality of the data is or anything like that.

Co-host: Awesome. Well, we're running up on the end of our hour long in depth interview. It's been a really good conversation with you, and I appreciate it, James. I probably disagree that people should take artificial sweeteners, because there's no benefit from them, and there's probably not a lot of ... If there are risks, there are no benefits, so they would fall on the why do it side of the bulletproof program.

I do like your science based, sane, nonhysterical approach to evaluating them. I appreciate that, and that's one of the reasons we wanted to have you on the show to avoid being some of those who would pick a side, and we only include information that we agree with in the show, because that would be less scientific than we try to be, and we're trying to get all of our listeners to have the knowledge that they need in order to make decisions, and to even look at effects of things like sweeteners or colorings or nitrates, and just evaluate themselves whether it's the right choice, rather than dictating.

Can you tell everyone who is listening where they can learn more about you? Give us your URL. Tell us the things that you do in terms of services for people, and things like that, and we will include links to everything you say on the show notes, and we'll have a full transcript of this up online shortly after we post the podcast.

James: Yeah. My website is weightology dot net, [www.weightology.net](http://www.weightology.net), and you can find everything there. I have a subscription part of the site, where I ... It's called weightology weekly, where I review one to two journal articles per week that mainly deal with weight loss and weight maintenance, but occasionally I cover other topics, like artificial sweeteners and things.

I try to take a very evidence based approach. I gather all the studies I can on a topic, or I'll do two approaches. I may either gather all the studies I can on a topic if it's a broad topic like artificial sweeteners, or I'll just cover one study, and I'll talk about what the researchers did, and how you can take the results of that study and apply it to your own life, what the limitations of the study are, because all studies have limitations.

It's basically like a weekly research review, and that's a subscription part of the site.

I, also, have blog posts on there, although I haven't written one in a while, but I do have some blog posts I eventually want to write.

I, also, do online weight loss and weight management consulting, and I'm, also, able to give lectures and talks as well.

I do want to thank you so much for the opportunity to interview, and I really appreciate you taking the time to interview me, and discuss all these topics, because obviously we're all very passionate about it.

Co-host: Jim, thanks a ton for your time on the show today. I really look forward to hearing more from you in the future.

Co-host: Thank you so much.

Co-host: If you enjoy this, you can help by leaving a positive ranking on iTunes. To learn more about biohacking, you can, also, follow us on Twitter, on [inaudible 00:57:29], or you can check the blog at [bulletproofexec.com](http://bulletproofexec.com), and again, please visit our forum. We'd love to have your comments, your questions, and your thoughts there.

## What We Cover

1. How did you get interested in fat loss and nutrition?
2. Are artificial sweeteners as bad as many people think?
3. Why do you think artificial sweeteners have gotten such a bad reputation?
4. The history of some of the most common artificial sweeteners, and their possible health effects/safety.
5. A research based approach to aspartame, neotame, Sucralose, acesulfame Potassium, stevia, and lohan wo.
6. What are the main concerns with preservatives, and are these concerns founded on research?
7. What are some of the preservatives people should try to avoid?
8. Are preservatives like MSG really that bad? What about nitrites and nitrates found in bacon?
9. Are there any health risks with dyes/colorings?

## Links From The Show

### Featured

[James Krieger](#)  
[Weighology.net](#)  
[The Health Sleuth](#)

## Food & Supplements

[L-Glutamine](#)  
[Erythritol](#)  
[Xylitol](#)  
[Stevia](#)  
[Nicotine Gum](#)  
[Saw Palmetto Extract](#)  
[Lindt 99% Dark Chocolate](#)  
[Bulletproof® Upgraded™ Coffee Beans](#)  
[Medium Chain Triglyceride \(MCT\) Oil](#)  
[Hydrolyzed Collagen Protein](#)  
[Piracetam](#)



Aniracetam  
VRP Magnesium  
Calcium-D-Glucarate  
Folate  
Ceramic Pans  
Le Creuset Enameled Cast Iron Skillet  
Tivoli Cookware  
Grape Seed Extract  
Green Tea Extract  
Dextrose Powder (glucose)

## Books

The Paleo Solution by Robb Wolf  
The Better Baby Book by Dave Asprey  
Good Calories, Bad Calories by Gary Taubes

## Gear

Garmin Forerunner 405 CX GPS Watch  
HeartMath emWave 2

## Listener Q & A Summary

1. Should you use L-Glutamine?
2. Will Saw Palmetto improve your health and increase hair growth?
3. Is nicotine gum a good way to boost mental performance?
4. How does the Bulletproof Diet differ from paleo?
5. What are Dave's top 3 baby hacks?
6. Can you use a Garmin 405 to track heart rate variability?
7. Will smart drugs improve endurance performance?
8. Does piracetam improve ADHD symptoms?
9. Should you take a multivitamin?
10. What is the safest cookware?



## Biohacker Report

(latest studies & research)

“Healthy Older Adults’ Sleep Predicts All-Cause Mortality at 4 to 19 Years of Follow-Up”

“The effect of particle size of whole-grain flour on plasma glucose, insulin, glucagon and thyroid-stimulating hormone in humans.”

“Concord grape juice supplementation improves memory function in older adults with mild cognitive impairment.”

## Questions for the podcast?

Leave your questions and responses in comments section below.

You can also ask your questions via...

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[Twitter](#)

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## Listener Questions

@CriticalMAS

Can you go into more details on L-Glutamine? Who should take it, how much, when, etc. thanks.

Zach

My wife is reading “The Healing Codes.” Do you have any experience with those guys and their techniques?

Clay

What are your thoughts on Saw Palmetto and health, particularly for hair loss? You all mentioned in a recent podcast that niacin is in coffee. What are your thoughts on supplementing with nicotine gum for focus?



Ron

How does the Bulletproof Diet differ from paleo?

Anthony

I recently started adopting a few of the lifestyle and diet changes you recommend and could not be more pleased with the results – I feel like a different person. I would like to ask you a question about your Better Baby Book. Do you have an update of when it will be available (I live in the UK)? I have a 5 month old baby boy who we are soon to start introducing solids to and would love your advice on what would be best to give him – or any other advice while we wait for the book!

Lydia

Could I use the HRV monitor on my Garmin 405 to achieve 'coherence' instead of buying the emWave2?

After listening to your podcast with Tim Noakes about the Central Governor Model of fatigue, I'm curious if it would make sense to take cognitive enhancers during a hard workout in addition to the usual carbohydrate supplementation to fight fatigue during endurance events?

Co-Host

Does piracetam help with ADHD symptoms?

Eric

What are your thoughts on multi-vitamins? Do you also take a multi? Is it worth it to take one?

Rich

What your recommendations for the best cookware? Should I use cast iron, stainless steel, porcelain, etc.

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