

BRAIN GUT 12: DARE TO DISAGREE?

READERS SUMMARY:

1. IS NUTRIENT DENSITY FROM A USDA CHART IMPORTANT IF IT IS OUT OF CONTEXT FOR THE SPECIES IN QUESTION?
2. PALEO SAYS PUFA'S ARE BAD. ARE THEY REALLY; OR IS OUR UNDERSTANDING OF THEM LACKING?
3. WHY IS IODINE A CRITICAL FOR A HUMAN?
4. IS GETTING A HASHIMOTO'S DIAGNOSIS LIKE GETTING A CANCER DIAGNOSIS?
5. DO WE HAVE A GIANT PHARMACY IN OUR HEAD?

We recently heard about nutrient density in the Brain gut 5 blog. It seems all of a sudden it has become a hot topic online too now. The one issue however that is not well understood or talked about enough, in my opinion, is putting this key factor in proper evolutionary and scientific context.

When someone uses the FDA and USDA massive databases to look at foods with the highest nutrient densities to make large assumptions what is best and what is not, you might be smart to begin to question if that is a wise assumption, to begin with. Let me explain. The tables are measuring the nutrient density of foods against other foods and not against the species of animals eating those foods. What it does not do is taking into consideration is the species of mammals who are eating that food. Does their physiology have some special requirements that may make nutrient density a false prophet for their nutrition?

Mammals are adapted to what they evolved to eat, not what they think they should eat. The process continues as their

evolution continues. That means modern humans are adapting even now, to the SAD, as scary as that may seem. In humans, physiologically what separates us from all land-based mammals is how incredibly complex our nervous systems are. When one considers nutrient density in our species you must look at the organs in us that use the most energy to really get the appropriate context of what we should be eating. If you don't do this you may find out, **what we can eat and not what we should eat.**

These are different questions with different implications.

Moreover, if one is healthy or if one is ill the nutrient density story may be different yet again. In humans close to 50{a7b724a0454d92c70890dedf5ec22a026af4df067c7b55aa6009b4d34d5da3c6} of the energy consumption is used up by the brain, heart, and gut during meals. This implies when we begin to consider nutrient density we need to look at these organs physiologically to see what they optimally require to function. I have done that. In Brain gut 5, I made the case, using the massive research efforts of Dr's Cunnane, Crawford, Tobias, and Kuipers that the human brain **can not function well** without a diet loaded in brain-specific nutrients that favor a specific form of hydrogen.

This directly implies from a physiologic standpoint, the brain specific nutrients are far more important than nutrient density recovered from a database.

Recently in an FB group, Brook Dubose posed this question: "I was reading some random things and came across the definition of an Apex Predator – "Apex predator species occupy the highest trophic level(s) and have a crucial role in maintaining the health of their ecosystems." <- humans are apex..argument for NEEDING to eat meat for nature's sake?"

His answer assumes that humans domain is over the land. I don't believe that. My response was this: Brooke what is the biggest ecosystem on our planet? You assume it is land by your

answer. What if I told you it is not. The earth is 75% ocean. Scientific facts should nudge you to begin to think differently.

What are brain, gut, and heart works best upon is the best measure of nutrient density in humans?

We also know from modern physiology books that the brain and heart work well on a template that is steeped in ketosis from animal fats that are saturated. This provides a massive influx of H^+ to the TCA and urea cycle. The brain and the heart have this feature in common, contrary to what you have heard your whole life. Ketosis in particular, for the brain, is **a requirement for postnatal brain growth and myelination of the major tracts in the CNS**. It remains critical as heteroplasmy rate expands with age. This also underlies why mother's milk is constructed by evolution to support nutritional ketosis for quite sometime after birth as a clean fuel source of H^+ . We will cover that later in this series.

If eating bacon, offal, and the skeletal meat was critical to brain development, we should see many mammalian predators with much more advanced neural systems than they currently possess, and yet we do not. Why hasn't paleo addressed that issue? Maybe they never considered the brain's evolution in hominids before they reviewed hunter gather data. Most mammalian predators eat foods with nutrient density found on the savanna, but they do not possess what humans have in their heads. This implies the nutrient density of foods in the current paleo template **can not** foster explosive CNS growth in our species or in any other on this planet. **They merely support its function after the nervous system has formed postnatally.**

NON GEEKS: Shellfish and seafood are critical for our species for a reason. Begin to ask yourself why that is.

It also implies that if these foods were “so nutrient dense for human brain evolution” then we should see many mammals who have a similar neural biological evolutionary progression that humans have taken. I have seen many comments in the paleosphere that meat eating supported brain growth. **This is completely false belief and unsupported in the literature or research, and it is just a meme and/or belief.** Dr. Cunnane is a world expert in neural lipid metabolism and I would suggest you read his work before you believe that current meme. No one in the paleo leadership has this background and I believe that is why it has been largely ignored. Moreover, no land-based mammals have complex nervous systems as humans do, eating these ‘so-called nutrient dense foods’ with these characteristics mentioned recently at AHS 2012. That is a big problem from an evolutionary standpoint. Begin to ask yourself why that may be the case.

Let us take a look at this recent abstract from here:

“An increased iodine requirement as a result of significant changes in human nutrition rather than a decreased environmental iodine supply is suggested to represent the main cause of the iodine deficiency disorders (IDD). The pathomechanism proposed is based on the fact that serum concentrations of thyroid hormones, especially of triiodothyronine (T3), are dependent on the amount of dietary carbohydrate. High-carbohydrate diets are associated with significantly higher serum T3 concentrations, low Vitamin A levels, compared with very low-carbohydrate diets. If you are paying attention, this set of circumstances cause pregnenolone steal syndrome. This is Mother Nature’s natural birth control for summer time after animals have delivered their young. This reduces their sex steroid hormones and allows them to focus on making sure their offspring survive. This is why the vegan diet in modern humans is fraught with so much infertility.

While our Paleolithic ancestors subsisted on a **very low**

carbohydrate/high protein diet, the agricultural revolution about 10,000 years ago brought about a significant increase in dietary carbohydrate. These nutritional changes have increased T3 levels significantly while lowering Vitamin A levels. This sensitized humans to the effect of blue light because opsin biology and Vitamin A cycles are linked. Higher T3 levels are associated with an enhanced T3 production and an increased iodine requirement. The **higher iodine** requirement **exceeds the availability of iodine** from environmental sources in many regions of the world, resulting in the development of IDD."

Many in the paleosphere have been reporting, for sometime, about pitfalls and dangers of a low carbohydrate diet with respect to thyroid function. What they have failed to mention, however, is that paleolithic man ate a *very low carb diet too!* Often that history is just ignored and many continue onward with their modern perceptions of what the diet contained. They never seem to ask themselves how they did our ancestors manage their free T3 on a low carb diet? When you do ask that question it might bring you to a different conclusion than most believe today, because it appears from most accounts we did not eat a diet high in carbs when we evolved. It is hard to contemplate something when you are not aware of; especially something you never even realized might be true.

It appears from the study of the bones of paleolithic humans they were able to somehow maintain their own optimal hormone status in spite of their lack of carbs are so critical to a free T3 level and high pregnenolone to support the pro-gestation of our species? We know hunter gathers looked the part of supreme health from old pictures and accounts of them in the last few hundred years.

Here is what they might have forgot to contemplate: there might be another way to drive thyroid function in humans without carbs. What might do that? **Iodine also drives the production of free T3 formation even when you eat a low carb**

diet! Iodine has always been the achilles heel in the paleo diet as it is written about in the popular paleo books. This is why many need supplements to improve their own results. My blog's focus has always been to point out that circadian biology is critical with respect to food and to light. It means in long light cycles we can, and should use carbohydrates to help support free T3 levels. But in low light seasons, we need to go ketototic and use a heavy seafood template because the iodine content in the marine food supports free T3 in fall and winter.

In ketosis, the human cell is the most chemically reduced it will ever be biochemically. This protects the cell from ROS and oxidation. Iodine is also a major antioxidant in human cells. In fact, Iodine protects the most sensitive parts of the human body from oxidation. Those areas are the human synapses of neurons. No area of the human body has a higher metabolic rate of oxygen consumption anywhere. This means it generates tremendous reactive oxygen species or inflammation. We all know our brain is what separates us from other mammals, but few of us have looked into the biochemistry or metabolism of the brain. My day job is to master those critical facts.

We are designed to eat a marine diet year round to lower the oxidative state in our cells to support the metabolic rate of our nervous system. Oxidation creates inflammation.

Inflammation causes leptin resistance. When we do not eat a marine diet, leptin resistance is the result. Neolithic disease follows.

YOU WANT THE ANTIDOTE FOR LOW CARB PALEO FLU THAT IS FAMOUS REFERRED TO EVERYWHERE ON THE NET?

EAT SHELL FISH LOADED WITH IODINE, AND EAT A LOT OF IT BECAUSE WHEN YOUR TANK IS EMPTIED OF IODINE BY MODERN LIFE AND A LAND BASED PALEO TEMPLATE YOU FAIL OR HAVE PLATEAUS COMBATING DISEASE!

The thyroid makes 80 mcgs a day of T4 and 5 mcg of T3 a day

in its normal basal state. Another 25 mcgs is made by peripheral monoiodination of T4 into T3 in the peripheral tissues. The conversion of T4 to T3 is stimulated by high iodine levels which in turn lowers the HS CRP. This is especially effective in the gut where a lot T4 is stored.

Since iodine is found in high concentration in seafood, which permeates our gut when we eat it, it shows forms meets function once again. It is often why the paleo diet may fail to meet your expectations based upon the promising stories and testimonials we find in the books and blogs around the internet. The meme out of AHS 2012 was bacon and offal is best for us **based upon USDA tables on nutrient density**.

TRUTH BOMB ALERT: Our brain's function directly imposes on our biochemistry, our real dietary needs, and it primarily determines what nutrients contain our best nutrient density.

You won't find that data in any USDA or FDA table. The tables have no biologic context because they never account for metabolism of the human brain.

Let us consider this proposal more closely. I don't believe this to be true or factual, (because the proper physiologic contexts were completely ignored by those who raised them) and as this series goes on, I will painstakingly show you why this might be the case. I believe, the answer is buried in neural lipid biology. This is something very few in the blogosphere know much about. This idea was not what the science has been leading many researchers like Kuipers, Tobias, and Crawford to see in recent times. It certainly was not what Dr. Remko Kuipers was bringing to the game at AHS 2012. Too few people even heard what Dr. Kuipers had to say in Boston, by all reports of his talk. That is sad for those of us who are interested in the science behind keeping us optimal, because he may know something no one else seems to know. It might be why the Epi-paleo Rx might give a far better result to patients who suffer from neolithic diseases, eating as we are designed to eat by evolutionary history. What they don't

realize is that even modern humans in decline as a species can increase their free T3 without their famous safe "paleo" starches. We are able to optimize our free T3 quickly eating an Epi-paleo Rx consistently year round. Eating carbohydrates in long light cycles creates more ROS in our mitochondria no matter when we eat them. The reason is simple. Carbs drive ROS at cytochrome one in our mitochondria. This is a biologic fact of life on earth. Fats and proteins are accounted for differently based upon their FADH/NADH ratio's.

This is critical for the biophysics of hydrogen protons in the TCA and urea cycle. Peter from Hyperlipid has an ongoing proton series now talking about the intricacies of this very issue. Iodine from our diet helps offset that inflammation and oxidation that carbs bring. In winter, when carbs are not readily available, you offset that dietary loss of carbs, by eating a **diet high in iodine**. Why did they not tell you this?

Why did few show up to Dr. Kuipers lecture at AHS 2012?

Humans need to do this because they have big brains. No other land based mammal needs to do this because they have small brains! The context to decipher this puzzle is about brains not bones!!!

Iodine is loaded in seafood and found in the marine food chain, not the land based one. That does not sit well with the tribes current stance. You must know this and change your stance regardless of what they continue to tell you. Read the works of the researchers I am quoting in this series. These principles are well studied and well established. They are just **not well known** in our paleo tribe. Humans did not evolve from a land based food chain, as many still believe in blogosphere. This belief is why they are not aware of how critical iodine is to human biochemistry. That meme is big in paleo because it fits their idea of what they 'think' happened. There is one problem with this thinking, in my view. They don't have a clue about how Mother Nature built a human brain from a primate brain to make that assumption.

Moreover, if they did they would begin to realize why paleo

often falls way short for a mammal with a large brain in its head who has a specific requirement for H^+ . The proof of that is found all over paleo forums.

Moreover, since the human brain is the key defining feature of humans from transitional apes, maybe, you need to begin to question the current meme too. That is precisely why this data remains in their blind spot even today. They just are not aware of what they do not know or understand. It is simply impossible to evolve a human brain eating meat/offal alone, when you understand how human brain evolution actually occurred. Again this is not my conjecture. The science on how we developed a brain is there for you to look at. I am just the neurosurgeon with the flashlight shining the light on how a brain is formed. It is published in many books I have had to read to become a neurosurgeon. Once again, I am telling people they need to get the complete story for our species before they make a decision on what dietary template is best.

A partial evolutionary story gets you partial clinical results. Examine this data for yourself, then decide. This series has many cites still yet to come many studies pointing out this foundational findings. The truth is often said to set us free, but when we first hear it, it usually pisses us off. I fully expect that response from the tribe.

NON GEEKS: You don't get a big brain and smart eating offal, bacon and meat alone regardless of its quality. Meat and offal eating does not lead to a human brain in the wild, at anytime in our evolutionary history.

Dolphins and whales are the only two other mammals who actually can boast some of this explosive neural development we share in our central nervous systems. Both of these mammals, share one common trait with humans. Their brain growth to body mass ratios were fueled by a seafood template of their diet. It appears that nutrient density for mammals

with complex nervous systems requires high levels of DHA and iodine. That was not the meme out of AHS this year. Only Dr. Kuipers had that the lone voice in Boston. I want to you read his work and decide for yourself.

Neither of these nutrients are found in high density in offal, bacon or in skeletal red meat as most believe. When one talks about the optimal nutrient density of foods in the human context, one must consider the mammalian central nervous system before one makes any assumptions, in my opinion. In fact, when one eats a paleo template today, the most common nutrient that is depleted is iodine, followed by DHA. I talked about this in my top ten paleo supplement blog long ago for a reason.

NON GEEKS: DHA and Iodine are a huge advantage for us because of how they affect protons. The next few blogs are going to open that discussion for you to explore.

Why is DHA and Iodine so important to humans?

Let us begin with DHA. DHA Is a PUFA. If you read the popular blogs and books they have few good words for PUFA's. Some praise DHA, but no one has done a good job of telling why DHA is special to our species, in my opinion.

BLIND SPOT ALERT: The reason for that is because it is a *brain chemistry story*.

Let's face it, no one who has wrote a book about paleo has any expertise in brain physiology or evolution. You may not realize this, but you better for your own well being. This series is exploring that very issue for you to examine for yourself with any dogma present. Arachidonic acid (AA) is another PUFA that has been vilified in many paleo writings.

Let us examine this to see if it is correct belief. I wrote over a year ago that vilifying omega 6 PUFA's may not be wise in mammals like us before AHS 2011!

NON GEEKS: Pay attention to the details in the brain because they are **big tell** what is best for us to eat, over what one thinks we can get away eating.

AA and DHA are PUFA's that work in magic together in the human brain. They are essential fatty acids that are critical to cell membrane signaling and structure. If you follow the work of biochemists and organic chemists they have told us that PUFA's are very susceptible to oxidation because of the double bonds they have in their chemical structures. This is true, but it has a big advantage for us as well. PUFA's store proton information in their spins. These protons are tightly controlled. Inflammation can unleash them. But here is what they did not tell you about PUFA's in the brain. **AA and DHA are critical for the human brain function.** These PUFA double bonds **are protected by iodine levels** in several special ways.

In Brain gut 5 we spoke about the special quantum effect of the pi electron clouds of DHA. This is a quantum effect built for protons. Now let us look at the most powerful protector of our DHA stores in all of our cells. Iodine is that protector of protons. When iodine is bound to AA and DHA it protects them from free oxygen radicals that oxidize them.

The second mechanism of protection of these PUFA's uses iodine and hydrogen peroxide in combination.

GEEK ALERT: An iodine peroxide catalyzes the iodolactonization of DHA and AA. The requirements for DHA and AA for iodolactone formation are the presence of an enzyme called iodo-peroxidase and an **elevated concentration of iodine** and the presence of hydrogen peroxide. These conditions can only be met in certain human tissues. These tissues are the thyroid gland and the choroid plexus of the of the brain.

Most of you know what the thyroid does. I doubt most of you understand what the choroid plexus does. The reason for this is because modern science and neurosurgery do not even know what its purpose is today. This is a tissue in the brain, I deal with every time I open someone's head for surgery. The

choroid plexus makes CSF fluid that surrounds the entire brain. We think CSF has a major effect on the chemical stability of the brain but we really do not know for sure at this point. CSF is an ultrafiltrate of the blood's plasma and it is made by specialized tissues in the brain's ventricles called the choroid plexus.

One thing we do know is that AA iodolactones **specifically inhibit** cellular signal transduction pathways that are induced by local growth factors that are released in many tissues.

They are a critical step in controlling cellular growth and helping regulate cell cycle to metabolic and circadian signals by controlling proton flows. For example, we know today that delta iodolactones have anti-proliferative effects (tumor growth). This is especially true in the brain and thyroid gland. This implies that when iodine levels are low in either of these tissue we might see increases in thyroid or brain tumors. In the last hundred years, **both of these types of cancers have risen dramatically and their incidence and prevalence. It is particularly startling over the last 50 years in human history.** When this occurs in the thyroid gland these iodolactone block the formation of goiters too. A goiter is an enlargement of the thyroid due to lack of iodine.

In 1990, we also found out that iodolipids, like iodoheptadecanal, is critical in the thyroid and brain physiology. It appears that these iodolipids are a critical player in the transport of iodide in the gut and thyroid.

They also direct the formation of T4 formation and secretion in the thyroid. T4 is the thyroid pro-hormone that is converted to T3 in the liver and gut, which is the bioactive form of thyroid hormone that gives us metabolic control and control over our synthesis of hormones from our LDL cholesterol. T3 is critical in making every hormone in the human body. I covered this in detail in the Hormone 101 blog long ago.

We also found out in the 1990's that reverse T3 and other

iodothyronies like T2 and T1 function as iodine transporters in humans. They also have a dual function in protecting PUFA's used in the brain from oxidation. **They are the most powerful inhibitors of lipid peroxidation in humans.** Many of you have heard many bloggers talk about lipid peroxidation many times over the last few years, but no one mentioned the iodine system that prevents lipids from being oxidized in the first place. They are so powerful, that they exceed the efficacy of vitamin E, glutathione, and vitamin C in humans.

Most of them however, have talked up these other BACK UP systems in humans. In fact, it appears the real reason vitamin C may have lost its role in humans, as a powerful antioxidant protector in cells, is because it is ***not strong enough*** to protect AA and DHA in human brain tissue, especially at the synapse of neurons. **Yes, the evolution of the human brain may be the reason Vitamin C lost its biologic mojo in our species. Iodine may have replaced its effects on protons in the TCA cycle.**

Forests do not have iodine sources but the marine chain did in the East African Rift.

The brain has the highest requirements of requirements of oxidative protection in the synapses between nerve cells. It appears that iodine is a lot better protector of all lipids in all cells not just the brain. If that what science says is true in the brain, and the brain separates us from apes, ***how in the hell did we do this without iodine if the current meme is correct?***

Simple.....we did not, and you may need to consider they maybe mistaken about what they believe.

You want some support for this assertion?

Kupper found in 2008, for example, that iodine is a supreme scavenger of ROS in RBC's and dramatically regulates the inflammatory response. He also mentioned in his 2008 paper,

that iodine is essential for all aerobic organisms because of how it protects these organisms from ROS in the face of oxygen. This ability is even found in sea based algae's that forms the base of the food chain in the sea. To understand how iodine can be used in disease protection that have associated ROS consider these clinical pearls from Dr. Jonathan Wright:

"Iodine is a basic element, like calcium, zinc, oxygen, etc. The word "iodine" usually refers to two iodine molecules chemically "stuck together," just as the word "oxygen" usually refers to two oxygen molecules "stuck together." Since pure iodine is more reactive to other elements, it's more likely to cause problems, so iodine is usually used as "iodide," a word that refers to one iodine molecule combined with another molecule – often potassium (KI). So, even though they're not technically the same, for simplicity's sake, I've used the terms iodine and SSKI (saturated solution of KI) interchangeably in this article (though always meaning SSKI unless noted otherwise)."

"When we're forced to travel by air, Holly and I drink a few ounces of water with 10 drops of SSKI. The SSKI rapidly accumulates in any and all body secretions, including in the sinuses, where it inhibits or kills bacteria, viruses, and fungi before they can cause an infection." This helps RBC function by improving their redox when flying in nnEMF at altitude. This helps proton motions in the blood plasma to interact and transfer data to WBC's.

SSKI is close to 100 percent effective in eliminating bladder infections, but the amount needed is a relatively high dose, so it's important to use it with caution."

"End years of suffering with painful breast and ovarian cysts in as little as three months." "In minor to moderate cases, 6 to 8 drops of SSKI taken daily in a few ounces of water will frequently reduce fibrocystic breast disease to insignificance

within three to six months.”

“Over the past 30 years, I’ve also used SSKI to treat at least 30 women – one of them my own daughter – for ovarian cysts. These cysts usually disappear within two to three months with the same quantity of SSKI mentioned above for breast cysts.”

“But please do not use this treatment for either of these conditions without monitoring your thyroid function.”

“Peyronie’s disease occurs when the tissue along the shaft of the penis thickens, causing erections to become increasingly curved and even painful. Applying SSKI to the thickened tissue twice a day over several months can soften it considerably and eventually allow for more normal functioning.”

“...hemorrhoids will disappear – sometimes literally overnight – when a mixture of 20 drops of SSKI and 1 ounce of flaxseed oil is applied to them at bedtime.”

“Dupuytren’s contracture is a condition sort of along the same lines as Peyronie’s disease, except in this case, the thickened tissue occurs along one of the tendons in the palm of the hand, pulling the connected finger down. If it progresses far enough, sometimes it’s impossible to straighten the finger out at all. Rubbing SSKI into the affected tissue of the palm at least twice a day can “loosen” it and prevent the condition from progressing to the point of causing a deformity or disability.”

“This loosening of thickened tissue also works for scars, especially keloids, which are abnormally thick (sometimes up to an inch) scars. Rubbing SSKI into a keloid at least twice daily will ultimately flatten it down to a normal scar. But patience really is a virtue here: It can take many months to a year for particularly bad ones. You can help the treatment go a bit faster if you mix SSKI “50-50” with DMSO.”

“Over 30 years ago, two ophthalmologists observed that when

they gave patients a combination tablet called "Iodo-niacin" (which contained 120 milligrams of iodide and 15 milligrams of niacin) and instructed them to take it for several months, the supplement actually reversed atherosclerotic clogging of arteries."

"Cysts and stones melt away with just one dose a day."

"Sebaceous cysts are another example of SSKI's ability to dissolve fats and oils. Unlike breast and ovarian cysts, sebaceous cysts contain oily, fatty material and usually appear rather suddenly on the face or in the groin area. But the good news is that you can get rid of them just as quickly as they come on – generally in just a week or two – by rubbing in a mixture of equal parts SSKI and DMSO."

"Parotid duct stones (which block the ducts that carry your saliva) can be dissolved in four to eight months just by drinking a glass of water containing 3 to 4 drops of SSKI each day."

"The SSKI and DMSO mixture doesn't work any faster, but it's just as effective as antifungal drugs – and definitely safer. Rub it on, around, and under the affected toenails. And make sure to wear old socks, because SSKI and other forms of iodine leave an orange-brown stain."

"SSKI can also help clear up vaginal infections. Twenty to 30 drops in water, used in a small douche" once daily for five to 10 days will usually do the job."

Dr. Wright ideas are correct by why they work is a mystery to this day to him. Iodine affects protons.

In my neurosurgical clinic, I have seen iodine replacement using my Epi-paleo Rx be able to seriously turn around degenerative disc disease in men and women over the last six years. When you have neolithic diseases with inflammation associated with it, it implies that you might also have an

iodine deficiency. I usually use a free T3 and free T4 level to show me if a patient is iodine deficient. ***Iodine is a supreme cellular antioxidant in all human cells.*** When pain and depression are present with a spine problem, I know that sleep efficiency is also poor. This was explored in Brain Gut 11.

NON GEEKS TRUTH BOMB ALERT: If you carb up, and increase your cross fit participation to raise your T3 as 'paleo theory' tells you to consider, you likely will be having surgery sooner than you think. If you do not believe that go look at internet forums and see how many young people have to have surgery to repair themselves after WOD's because they are specifically deficient in iodine, toxic in blue-lit gyms, while simultaneously eating large amounts of "safe carbs" to support their free T3 levels to work out. You need to question that logic using evolutionary evidence. ***That is not the road to optimal in my view. It is the road to my operating room.*** That choice is yours.

WHAT IS THE LINK TO IODINE/IODIDE TO AN OXIDIZING DISEASE LIKE HASHIMOTO'S DISEASE?

Venturi reported in 1985 that iodine was the first inorganic antioxidant to be described in any living system on this planet. He showed that iodine is collected in cells by proteins in its iodide form and is bound to amino acids to form iodoproteins. It was later discovered that in all vertebrate cells iodide acts as electron donors in the presence of hydrogen peroxide and thyroid peroxidase enzyme.

This enzyme is the one that is destroyed in Hashimoto's thyroiditis by auto antibodies. This helps explain why Hashimoto's is often seen as the first step in many neolithic disease's that **oxidize human tissues** to alter cellular signaling. It also helps explain why Hashimoto's disease is now so common today. Iodine is blocked by the action of fluorine.

IODINE IS THE MAJOR ANTIOXIDANT IN THE BRAIN SIGNALING SYSTEM: *THE BRAIN MAKES US A SPECIAL SPECIES*

When a person is iodine deficient, a person loses the ability to handle ROS (oxidation) optimally, and other organ systems have to offset those losses to protect the cell from more oxidation. When this happens we see a failure in their adrenal stress index because the cell is placed in a chronic survival mode. The person must rely on the “alternate biologic systems” built in to cells to handle these problems and they eventually become overwhelmed. That is the uric acid system, Vitamin E and C systems, and glutathione systems in humans.

This often leads to a slow progressive decline in function on a physiologic basis of many organ systems in the body over time. It can occur in any organ system, but Hashimoto's has a particular affinity to those two tissues in which iodine plays a critical role. The thyroid and the brain, especially the HPA axis in the brain. This loss is potentiated by the dehydration effect on water by fluoride. Loss of iodine degrades sleep and synaptic function as the first step in disease generation. Iodine is found in high concentrations in the synapse of neurons to optimize signaling. With more time for further iodine loss, it affects more epithelial tissues like the breast, ovaries, and testes to cause fibrocystic disease, cancer and infertility. It even can cause thyroid cancers. Once iodine goes, Magnesium is not far behind. This affects our cells ability to make energy from ATP. Our bodies ATPase is magnesium dependent. This is why diabetics and fat folks are so magnesium deficient; because they are energy inefficient because they live in the chronic oxidative pathway their entire life. Eventually, this degrades their sleep and their ability to think clearly.

HOW DO CELLS LOSE THEIR ABILITY TO SIGNAL?

When cells lose iodine chronically and it is not replaced in the diet constantly, they lose the cellular ability to properly signal. Cells lose the ability to signal correctly

and can not “**chemically reduce**” themselves at night when we sleep. This causes all organs to age faster with time because sleep is restorative by reducing our cells. It causes the neolithic disease to happen earlier. This is precisely why bad sleep is associated with all diseases. Sleep is when we are the most chemically reduced in our entire life. When we do not sleep we are more oxidized or inflamed biochemically.

CRITICAL BG 12 POINT ALERT: When this chemical effect is CHRONICALLY present, the decision in the cell always has to be made between survival or reproduction based upon how the cell signals using its nuclear hormones. When we are oxidized we are consuming our hormones. UV light actually inactivates our sex steroid hormones. This is another form of natural childbirth in summer months when UV light dominates. When we are reduced we are resupplying them in the great pharmacy in our brains. This means that all the LDL cholesterol that is normally made into pregnenolone will either go into cortisol OR to the progesterone pathway. If all the pregnenolone shunts to cortisol’s path, it helps you survive life’s oxidation. The shunting signal that determines that choice is the level of cellular inflammation that oxidizes the cell.

When we measure cortisol in the plasma, saliva, or urine, it is often low when we are oxidized chronically. That is a sign the PVN nucleus in our brain is working over time, and this is a sign you are oxidizing your cells. You are aging faster than normal. This is measured clinically by an adrenal stress index test and really accurate in a low salivary melatonin level and flatlined cortisol curve. The result is all the hormones going the “other way” in the hormone synthesis chain are very low.....that is the “reduction path”. Reduction means you are staying younger. If you re read Brain Gut 11 you will see what a chronic low cortisol buys us. Low cortisol = low melatonin = epithelial cancers = LR. We tend to get cancer as we age. It follows then that oxidation = Leptin Resistance and LR = aging. Low cortisol is not a good thing for a human long term. When the process first begins.....ACUTELY,

you will have hyper-cortisolism for a time, until you fatigue the output of your PVN nucleus in the hypothalamus. That PVN nucleus is just one of the major pharmacies that function in your brain. Oxidation occurs when you cannot use the TCA or urea cycle optimally. If you do that long enough, you oxidize (age) your body, while simultaneously destroying your sleep, to cause your body to slowly begin to fail while your body composition declines. For example, Hashimoto's disease is a disease of chronic oxidation for the human nervous system. It depletes you of the life giving chemicals in the pharmacy that resides in your brain. This is why it is associated with so many other neolithic diseases.

CANCER = A LOSS OF CELLULAR OPTIMAL SIGNALING

Remember back to the Hormone 101 blog post: The critical equation of life = **LDL cholesterol + T3 (and Vitamin A) = pregnenolone**. This implies if free T3 is low, or Vitamin A low due to excessive blue light exposure for any reason, you can't make enough pregnenolone or sex steroid hormones. This is why fertility doctors are getting rich today. Everyone is defective on both sides of this equation because of a paucity of sunlight. If you live a life in the modern world, you are constantly in survival mode, (living in the cortisol pathway of oxidation) shunting the already low amount of pregnenolone to the cortisol pathway. Your cells are designed to always pick survival over reproduction, so they make cortisol at the sake of making progesterone. Progesterone is the base hormone in both sexes for the DHEA, testosterone, estrogen, etc (the hormones of fertility). The more and longer we shunt to survival mode hormones, the less fertility hormones we make. More survival path activation of cortisol also makes the cell more oxidized, and the faster the cell age. The faster the cell ages the shorter its telomeres get. When they get short enough we wind up with another decision. Cell death or immortality is the choice. **That is what cancer really is; a decision to become immortal over cell suicide.** Life is

looking for a way to survive a massive oxidative effect. So far, life has not found a way around this situation. It appears the best current solution to this problem is to never lose your ability to cell signaling by avoiding oxidation, to begin with. This is why we want to limit inflammation at all costs. It improves our ability to signal well. It is the result of a loss of cellular signaling that speeds up the shortening of our telomeres that leads to all cancers.

Moreover, the more oxidized the cell becomes, the more Vitamin D has to be used to offset this increased oxidation as a buffer to keep the immune system activated to work. Our immune system protects us from cancers. When this process goes on chronically, Vitamin D levels eventually falls with oxidation too. This is why low sulfated Vitamin D3 levels are associated with higher cancer rates, like breast cancer.

LOSS OF CELLULAR SIGNALING = INFERTILITY

It is also why infertility plagues modern humans, (1 in 7 couples) because to have a child you must be more chemically reduced than oxidized, because of a state of reduction in the signal that favors a higher level of the pro-GESTATION hormone called progesterone. Most modern humans are starved for progesterone because modern life keeps them in the survival pathway of cortisol. Brain Gut 11 laid all that foundational science out for you. Hashimoto's is a disease that also keeps you in the survival pathway (oxidized).

KEY POINT: Evolution says, the cell must always chose between "survival or reproduction," and the inflammation levels are the "traffic cop" who helps make that decision for our cells.

Hence, this is why we see upside down PG/E2 ratios in all modern neolithic diseases. When this happens chronically, the lab panels we order show increased HS CRP, increased E2, and LR, with LOW free T3 and Vitamin A levels. Lowered sulfated

Vitamin D3 levels are an epidemic because modern life is forcing us indoors in front of a blue-lit screen and allowed us to live in a constant state of oxidation. This removes us from the survival pathway (cortisol).

DAYLIGHT AND SUMMER, NIGHT TIME AND WINTER:

In daylight, human physiology is in a state of oxidation because we are burning lots of ATP (energy) because of activity. When light cycles are longest, in summer, we are also oxidized most. This is also when carbohydrates grow. They also cause more ROS than any other macronutrient at the mitochondrial level. Why you ask?

GEEK ALERT: During oxidative phosphorylation, almost all of the reducing equivalents produced by glucose metabolism in the Krebs cycle are in the form of NADH with the exception of the succinate dehydrogenase step, which takes place in mitochondrial complex II and makes FADH₂. Metabolism of one molecule of glucose produces an NADH:FADH₂ ratio of 5:1 whereas fatty acid metabolism in beta oxidation and the Krebs cycle will produce a ratio of 5:3:1 depending on the length of the fatty acid. This creates a stable of H⁺ to run the anion cycle of the intermediates to keep the body reduced and far from equilibrium.

NADH is oxidized only in mitochondrial complex I whereas FADH₂ is oxidized only in complex II. Complex I produces more reactive oxygen species than complex II. NADH is an electron and proton carrier of the TCA and urea cycle.

As such, production of a specific number of ATP molecules from glucose has the potential to generate more reactive oxygen species compared to the generation of the same number of ATP molecules from fatty acids. This is why glucose metabolism can provide brisk ELF-UV light for biosynthesis. Proliferation is limited by the oxygen tensions in a cell. Glucose metabolism is favored in hypoxic environments and

that is why it is an ancient pathway that existed before the Pasteur effect of the Cambrian explosion. When oxygen showed up on Earth in abundance it stimulated massive biodiversity which helped build the complexity of life. The TCA cycle furthered that explosion of life.

NON GEEKS: At night during sleep, we are in a state of chemical reduction. It is during sleep that our cells are repairing the damage we have done to our cells during the light of day. In winter, when carbohydrates are sparse, we are the most reduced of any season. This is another reason Cold Thermogenesis is so effective at limiting inflammation.

It fosters a chemically reduced state. Hashimoto's disease is a disease of constant chemical oxidation during day or night and all summer or winter. The reason is simple for this. **Since Hashimoto's destroys your thyroid's ability to make free T3, you have chronic low levels of free T3 to convert your LDL to pregnenolone.** This keeps you in a chronic state of oxidation no matter what time of the year you are in! Physiologically when you get to the step in the hormone chain that is pregnenolone the cell has two choices to make, survival, the cortisol path, or pro gestation, the reproductive path.

When we chose survival we are in a state of chemical oxidation constantly. This is why an adrenal stress index is quite helpful clinically in understanding the current pathway your body resides in. This tells you how healthy or sick you really are. When you are in a pro-gestation path, you are more chemically reduced as you are in night. You are able to make the distal hormones, progesterone, DHEA, estrogen, testosterone and Vitamin D easily and in proper physiologic quantities. The pharmacy in your brain is open for business and well stocked. This is why your hormone panel tells all about your health. It tells you whether your house is on fire or whether your ready to make a new generation of humans.

Evolution says the battle for life should be met when there

are low stress and low oxidation. When we are stressed or being chased by a great white shark, our goal is to flee to survive another day. This is a heavily oxidized state. When you're a modern human, you often live in this state your entire life. This is why we see trashed hormone panels that confuse so many patients and clinicians today. When you get the blueprint for the battle in the cell, you can reengineer people back to the reduced state.....Hashimoto's, artificial light, chronic cardio, and chronic WOD's are all oxidative events that push you down the wrong pathway. Eating a diet that is highly chemically reduced (think Epi-paleo), help's mitigate these risks, but not entirely. You just can't out supplement or out exercise a bad diet no matter what some people may tell you to believe.

GEEKS and NON GEEKS: Hashi's is a gateway disease to many illnesses because we cant fight the inflammtory cascade well any longer. It depletes the immune system and the antioxidant system in cells to alter proper signaling. This cascades when reserves are diminished and causes massive alterations in adrenal stress index testing which signifies an issue in the circadian signaling of cortisol/DHEA/melatonin system of the brain. DHEA, oxytocin, and melatonin are the three gateway hormones that oversee the antioxidant protection system in the brain. **This implies that adrenal fatigue is not really an adrenal disease.....it is a failure of the brain's ability to defend itself due to altered signaling in the neurohumoral and neuroendocrine system.**

Many times women with Hashimoto's will develop eating disorders and auto antibodies that block nuclear receptors this area (PVN) of the HPA axis and it will give a characteristic abnormal diurnal pattern of cortisol depression in the middle of the day. The antibodies often signal to the astute clinician that an autoimmune disease is lurking in this axis. These antibodies can alter the ability of the nuclear hormone receptors in paraventricular nucleus in the brain,

altering the cellular signaling to any stressors and inflammation present. The PVN is a central area of “stress management” of the human brain. It is here where oxytocin, CRH, TRH, ACTH, GNRH all act, and are released. Their synaptic effects then project all over the cerebral cortex to cause their normal physical effects we expect. This is the seat of control of the neuro-immunological system in all humans. This is where the pharmacy of our brain is. ***The brain is the major drug pusher of hormones to the rest of the body to optimize signaling.*** This is an area of the brain that is firmly in **NEURAL GEEK TERRITORY** for most readers. I will be writing about this in the future of this series. It is the major control center for the real etiology of what people call “adrenal fatigue”. **The source is in the brain, at the hypothalamus/brainstem, and not the adrenal gland as most believe.** This is why adrenal fatigue is rarely solved with most of the OTC moves everyone seems to recite on the net. You have to fix the circadian signals in the eye first, that destroy the PVN’s control over CRH, TRH, DHEA, and oxytocin to make headway when you are oxidized.

The incidence and prevalence of Hashimoto’s has grown tremendously in the the last 30 years. When I was writing this blog post several months ago, I opened my Robbin’s pathology book from medical school (1986) and read a passage on Hashimoto’s. What it said there was shocking to me today. It said that this type of thyroid disease was rather rare and that medicine has several good surgical and medical ways of dealing with this rare condition. Today, 80-90{a7b724a0454d92c70890dedf5ec22a026af4df067c7b55aa6009b4d34d5da3c6} of people diagnosed hypothyroidism today, have Hashimoto’s today. This is a dramatic change of events in a small amount of time. This is why Hashimoto’s is now becoming known as a gateway disease to many chronic neolithic diseases today. It allows for tremendous damage to cell membrane signaling that directly affect the physiology of the organ in question. This opens the door to many disease processes. As

you saw above in Dr. Wright's newsletter, there now are many reports of the supreme antioxidant activities of iodides in many chronic neolithic diseases like cancer, atherosclerosis, cataract formation, CAD, and musculoskeletal diseases like osteoarthritis. This also have been verified in other mammals now when scientists are beginning to look at how iodine functions in cellular immunity.

It seems to me, this data is not well known in the paleosphere. The reason maybe because **the paleo diet is historically very low in iodine, no matter how it is constructed in the modern world.** The reason is simple, seafood is not a large part of the diet as it is described in Cordain's original books or research papers because he did not appreciate how we really evolved in the East African rift zone. This is further confirmed in the popular books that followed, and in the data reviewed by Cordain in his latest book as well. He does not look at seafood carefully, even though the charts on pages 108-113 in *The Paleo Answer* say we should be carefully examining this data very closely. When you understand neural chemistry you can not help realize how incredibly important iodine is. Iodine and thyroid hormone are crucial for brain development and functioning throughout human evolution. It just seems to have been ignored by paleoanthropologists.

I think we need to look at the data of neural lipid scientists to really gain some insight into this topic. Moreover, this appears to be why the Mediterranean diet has fared so well in most nutrition studies done over the last 50 years in the medical literature. While this diet still allows for some harmful foods to humans, like grains and legumes, it has superior amounts of iodine to offset some of the harmful effects of the grains and legumes in this nutritional template. In my view, it would make sense then to remove the harmful nutrients and **increase the nutrients whose density favors lower inflammation and higher iodine levels.** This is

precisely what the Epi-paleo Rx prescribes. I found nothing in Cordain's work to argue with the nutrient density of shellfish and seafood to unseat this hypothesis. He just seems to have missed the data that is littered all over many scientific disciplines. He also has not considered the special metabolic effects of the human central nervous system that requires this template to optimally function. You need to appreciate this and examine it closely.

Let me be clear here, so no one uses my words out of context.

I like what the 99{a7b724a0454d92c70890dedf5ec22a026af4df067c7b55aa6009b4d34d5da3c6} of what the 'paleo team' brings to the table. I like their leaders, inspite of what they say or do to me **because I buy**

100{a7b724a0454d92c70890dedf5ec22a026af4df067c7b55aa6009b4d34d5da3c6} why they are doing it. We all must be starfish in our own way!

WHY DO I DARE TO DISAGREE?

If our goal is to really understand our world better, our **lack of scientific diversity** is what really makes it a more difficult task. I am no exercise guru, gym owner, or research scientist. But they are no experts on neural biology. And humans have big brains, and this is what separates us from all eutherian mammals. I am a clinician who thinks best outside the box and lets the science guide me. Paleo can be described as a team or a tribe today. Team building requires you to limit the diversity of thought, and subjugate it for a common goal. It sounds counterintuitive at first, but this is what the concept of "group think" is all about. There is an entire social science built upon this subject and concept. When people begin to all share values and scientific beliefs, they become a sort of "team". Moreover, once you engage the "science team", it shuts down open minded thinking that goes against what the tribe believes to be true. Normally this is not a big issue, if things are truly correct scientifically,

for those values or beliefs the group holds sacred.

But what if they are not correct? In my view, that is my role on the team. Someone has to challenge conventional thought even in an unconventional group of people. I am that guy. It makes me a target. I am OK with it, because I am looking out for our optimal health, and nothing else. This path got my own health back. I think it is worth sharing with you too.

What if you are not aware of something you never considered? What my blog represents, is that guy, who dares to disagree with the current beliefs. I tell all my members and readers to question everything, including what I tell them, or write about. I already know I don't know everything, even though many of my critics will put words in my mouth that suits their agenda best.

One thing I do know about, is how this information help fix me and my family. It then helped me fix many patients. We did not get the results found on most paleo sites doing it their way. We used a different method. Because we did it differently does that mean they were wrong and we were right?

No. It means we have more to learn about each method. When you can not get the results you see from the public testamonials we are all accustomed to seeing weekly, I want you to know why you can't. I do not want you to be depressed or shell shocked because the advice given elsewhere just does not work for you. I do not want you thinking you are broken deeply somehow. **I rather enjoy a collaborative model of scientific exploration, that requires my thinking brothers and sisters, not to become echo chambers of the same beliefs the tribe currently has.**

In order to get different results, we need to think differently about things at times. The science of DHA alone, tells you something is very off in the current belief structure. I want to be ***that lone nut***, that gets you to look at something the whole tribe believes to be true for yourself.

But do it without having to worry about what the tribe thinks of you or your methods. That is what the comment section of my blog is for. It's for you to exert your ability to think differently than you usually might given the tribe's beliefs. I want everyone who is sick and tired of being sick and tired to come here and read. I want the weary who have failed the Rx found in the medical books we have all read to come find out why. My blog is not for those of you who have found success easily. **It is for the people who have not found success for a reason.** I want you to know why everyone's mileage varies in this journey to optimal. I do not want you thinking there is something wrong with you. I want to teach how our 'Ferrari' really works, and for you to discover that you too can reclaim your health when you understand the owners manual you came with. I agree with most of what they say, but on brain biochemistry, they do not have it all together. That is their puzzle. As a quantum clinician, my job is to make sense of our present biochemistry puzzle. The biophysical levers that control biochemistry are the keys they are missing. Every one of us is at a different point on the same continuum of human biochemistry. Deciphering where you are at now is my domain. There is a scientific epistemologic basis of how the laws of biochemistry apply to our species, and that is universal for our species. I am trying to show you how it works in an evolutionary context, and not how we think it works.

The concept of "team" requires confirmation in the face of adversity. I want to you embrace that discomfort with this information, and realize that all of what we believe may not be what we all thought. Will, you allow yourself to examine things for yourself and **dare to disagree** with your perceptions of your current truth?

Victory is had by opening eyes on both sides of the aisle. There's room for many opinions, as long as we all warn the readers that with or without degrees, they have to take their

own lives into their own hands using mitohacks that surf with nature's waves.

SUMMARY:

ANOTHER TRUTH BOMB ALERT: Nutrient density is a function of the mammals physiology eating that nutrient, not a USDA food database taken out of that physiologic context!

The larger the brain the mammal has the more iodine levels in the dietary nutrients becomes critical. **IE:** The brains evolutionary construction is what controls the decision process of what foods we should be determining contains optimal nutrient density, not someone's belief of such.

Iodine is not conserved in human physiology to any great degree. *This implies that our environment always had a deep supply, from an evolutionary standpoint.* This foundational fact, is in many people's blind spot today. It is underscored when you consider that human physiology has no source to concentrate or reserve iodine for future use at all in human physiology. A constant source is required for proper neurologic and thyroid functioning. I want you to examine it and realize why iodine is critical when you have a massive brain.

The greatest enemy of knowledge is not ignorance. It is the "illusion of knowledge". When you know better – you do better. *If you are not doing better, ask better questions to get to answers you need, and not the answers Rx by the tribe.*

In 2005, when I began my own study of the literature, I was taken by the fact that Liu showed that ROS and lipid peroxidation increased dramatically in both rodents and human children that were iodine deficient. It did not matter what the glutathione, Vitamin C or E levels were intracellularly in these cases. ***This implied to me that iodine is critical to us humans.*** It appeared that iodine has a magical effect on the

PUFA's when they interact. This effect is found in all mammals, no matter how complex or simple their nervous systems were, but it becomes the most critical element when neural complexity increases. Humans fit that bill to a T. This blog is not about reading research on rats or mice physiology in getting well. It is about you getting well. This data all implied to me early on that iodine had to be a critical part of getting people healthy from a illness state. As a physician, my goal is to get people well, if I can. I think this information is critical in that regard, so I am sharing it with you. Today almost 1/4 of the total human population consumes diets that are completely inadequate in supporting brain development and proper functioning over their lives because their diet lacks the essential brain nutrients I laid out in Brain Gut 5.

The key question for you now is to ask yourself today is what kind of dietary template are you using for yourself today, and why are you really doing it? Are you eating that diet in the sun while connected to Earth? **If not, do you dare to disagree with your tribe?**

A narrow mind will be your most harmful thing you'll ever own.....

Today, begin to swim against the tide. Rock the boat. Paddle your own canoe. Decide to be different than average. When you dare to go against the grain, you dare to live life to its absolute fullest. That is where optimal lies for us all.

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