

Hello Functional Medicine Discussion Group Members:

We another evening of fun and education at our Functional Medicine Discussion Group meeting on November 17 due to our special guest presenters, Adam Banning, Dr. Howard Elkin, Chris McClain, and Dr. Laslo Boros, who participated in our diet debate. We thank **Metagenics** for generously sponsoring the food and the venue once again. Thanks to all our members who participated in the meeting, including those just attended their first meeting. We will not have a meeting in December, our first dark month. Our next meeting will be **Thursday, January 19** at 6:30 and Miriam Zacharias will be joining us in a discussion on how to market a Functional Medicine practice. **Please email me if you will be able to attend.** I will send out another email with some articles to read in week or so. In the meantime, you might want to buy her book, *The Peace Process*, <http://www.barnesandnoble.com/w/the-peace-process-miriam-g-zacharias/1121293100?ean=9780990913009> and read it before the meeting. I have posted a link to the video of the discussion on our **closed Facebook page, Functional Medicine Discussion Group of Santa Monica**, so please join and participate. We have already had several lively discussions there.

## **Mediterranean Diet**

Adam Banning of Metagenics was our first presenter and he did a fantastic job arguing for the Mediterranean diet in the limited amount of time given to each presenter, 15 minutes. Adam pointed out that the Mediterranean diet was originally determined by observing the eating style practiced in Greece and southern Italy in the 1960s, though some studies also looked at diet patterns in other countries in the Mediterranean region—Spain, France, northern African countries, Turkey, Israel—and Adam mentioned Ansel Keys and the infamous seven countries study. Adam pointed out that there are a lot of studies showing that the Mediterranean diet is health promoting. In the mid 1990s Walter Willett of Harvard published on the Mediterranean and from that point on, it got a lot of momentum. [http://www.prep-blog.com/PDF/The\\_Mediterranean\\_diet\\_science\\_and\\_practice.pdf](http://www.prep-blog.com/PDF/The_Mediterranean_diet_science_and_practice.pdf)

Adam explained that at the time, nutritionists in the US were looking to the low fat diet to promote health, based on the belief that the high fat American diet was leading to heart disease and cancer and the belief that all fat was bad. But some patients were having negative health effects, so this led to the **French Paradox, where it was pointed out that the French had much lower rates of heart disease than Americans, despite consuming a higher fat diet.** This led to the concept of good vs bad fats. Adam mentioned the Food Pyramid and the part that supermarkets played in designing it to encourage Americans to eat various food groups daily to prevent spoilage of food, a fact I had never heard and was unable to confirm in a thorough internet search. But the USDA food pyramid has been a very controversial topic for many years and there have certainly been food industry lobbyists who have played a part in making sure that it promotes the food categories that they represent, whether it be the wheat and grain growers, the dairy lobby, or the meat lobby. Walter Willet produced a Mediterranean diet pyramid to reflect his belief in the health promoting effects of this eating and lifestyle approach <http://ajcn.nutrition.org/content/61/6/1402S.short>

Adam then presented the Cretan (as in Crete, Greece) version of the Mediterranean diet, which consists of regular consumption of lots of fresh vegetables and fruits, legumes, cold pressed, extra virgin olive oil, whole grain breads, low intake of white bread, pastries, and desserts, low intake of beef, lamb, and pork and no deli meat, unlimited intake of poultry, low intake of saturated fats, cheese intake of ½ to 1 ounce per day and plain yogurt one cup per day. There is no intake of cream, butter, milk, or corn oil. Fish consumption was encouraged as well as daily consumption of 6-8 nuts per serving. They average drinking one glass of red wine per day, according to Adam. This program is staying close to the earth and moderation and low intake of animal products. The main meal is eaten at 2 pm and meat is eaten more like a garnish and there are no desserts eaten after a meal. Herbs like garlic, parsley, basil, mint, fennel, etc. are frequently used to season the food. Fat is 25-30% of the diet but saturated fat is only 8% of the diet.

The Mediterranean diet is the only diet proven to reduce mortality and heart disease. Adam quoted from the Lyons Heart Study, but he could have quoted from dozens of studies demonstrating cardiovascular benefits of the Mediterranean diet. <http://circ.ahajournals.org/content/103/13/1823> They looked at 605 subjects who recently had heart attacks and who were placed on either a Mediterranean diet or the low fat American Heart Association diet, and they followed them for 5 years, and they found that those who followed the Mediterranean diet had a 50% to 70% lower risk of recurrent heart disease. There is also a decreased risk of cognitive decline and Alzheimer's disease and other neurological diseases. <https://www.ncbi.nlm.nih.gov/pubmed/25961184> Here is one paper showing decreased mortality related to Alzheimer's disease in those following a Mediterranean diet: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2673956/> Adam said that just because there is all this data supporting the Mediterranean diet doesn't mean that the Paleo or the Ketogenic diets are not also protective, but only that they don't have as much data at this time. Adam then quoted from a study showing that the Mediterranean diet improved insulin sensitivity and reduced diabetes risk. Unfortunately, my video of the meeting does not allow us to see the slides, so I don't know which studies Adam is referencing, but here is a paper on Mediterranean diet and diabetes risk: <https://www.ncbi.nlm.nih.gov/pubmed/25961184> And the following study demonstrates that following a Mediterranean diet reduces mortality rates in individuals with diabetes: <http://cpr.sagepub.com/content/23/4/400.abstract> Adam also discussed the reduced cancer risk that has been shown with adherence to the Mediterranean style of eating, which this paper summarizes recent research: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4778149/> Extra virgin olive oil, an important component of the Mediterranean diet, has been shown to reduce breast cancer risk: <http://jamanetwork.com/journals/jamainternalmedicine/fullarticle/2434738?resultClick=1> Adam mentioned that the Mediterranean diet is part of a lifestyle that connects people to the earth and nature and that eating is a social habit.

Roxanne Yahner mentioned that her experience with the Mediterranean diet was not good and she found that when she started to eat a diet closer to her heritage—Polish—she does much better. She found that her genetics are expressed better through a diet closer to Eastern European cultural traditions. Adam mentioned that the Mediterranean diet is very rich in grains and this can be quite

problematic, esp. since most wheat in the US has been hybridized to have higher gluten content and is genetically modified as well. For some of these folks, the Paleo diet may be better.

## Vegetarian Diet

Chris McClain then gave us some persuasive information in favor of a plant based approach, which he is incredibly passionate about, having been a vegetarian for 29 years. He mentioned that he survived a near fatal TBI in 2009. He said that he has a new name for a vegetarian diet: a medical body ecology diet, which refers to the fact that a vegetarian diet is the best way to feed your microbiome in your gut and your brain.

Chris explained that **a vegetarian diet is more efficient, since if you have an acre of land you can either raise a cow and feed one person, or you can raise potatoes and feed 16 people.** A vegetarian diet also promotes the sustainability of the planet, since if you are going to feed the world with meat, there is not enough land on earth to graze all of the cows we will need. In the US we are already using 40% of the land to graze cattle, so where are we going to get the land to graze all of these cattle if we are going to expand this meat based diet to all the people who live and are going to be living on planet earth?

We are an extension of the ecosystem and we need to avoid environmental toxins that destroy the microbiome, which keeps us healthy. **As we have deforested the planet by 80%, the Human Gut Project has shown us that we have also depleted our microbiome by the same 80%--a direct correlation between destroying the environment and damage to our bodies.** We need to eat in a way that protects the planet. Chris mentioned the risk of climate change if global temperature continues to rise and sea levels rise unless we make drastic changes in the next five years. And 80% of the world's population lives on the coasts.

A vegetarian diet is one that includes fruits, vegetables, tubers, whole grains, legumes, nuts and seeds, and excludes or minimizes meat, including beef and chicken, fish, eggs, and dairy, highly refined foods like bleached flour, sugar, and refined oils. Chris explained that he does not consider oil a healthy food, a view he shares in common with Dr. Furman, who wrote Eat To Live.

Chris explained that natural food stores often sell beef that is organic and dairy that is hormone and antibiotic free. These products come from animals who were fed organically grown grain, but who typically still spent most of their lives in feedlots. **Just as organic does not mean grass-fed, grass-fed does not mean organic.** Pastured animals sometimes graze on land that has been treated with synthetic fertilizers and even doused with herbicides. Unless the meat label specifically says it is both grass fed and organic, it isn't.

Chris talked about how bad the Standard American Diet is, which includes 65% processed foods and refined foods, and why the Mediterranean diet is beneficial is because it is not the SAD. Why do we recommend plant based diets to our patients? **Mainly to avoid cardiovascular disease, since plant based diets have been shown to increase arterial flow, whereas lower carb, higher protein diets decrease arterial flow to the limbs and periphery.** Did you ever see bacon grease in a pan? It becomes

hard and solid. After you eat a big mac and a shake and fries, that same grease is present in your blood stream. After you eat a high fat meal, your red blood cells becomes clumped together for 5 to 6 hours and you get decreased oxygen flow, known as hypoxia. Chris also explained that saturated fat helps facilitate the transport of endotoxins from the gut into the arterial walls, where they cause inflammation, which leads to blockages. Chris also quoted from Dr. Gregor who claims that **fat promotes insulin resistance**, since tiny droplets of fat in muscle cells, known as intra-myocellular fat, gum up the locks in our muscles cells that prevents insulin from letting glucose into the muscles. <http://nutritionfacts.org/2016/11/17/fat-is-the-cause-of-type-2-diabetes> Chris also claimed that cultures that eat the least animal foods have the lowest rate of heart disease, such as in Uganda.

If 80% of deaths are caused by diet, how come physicians spend so little time counseling their patients about diet? The average time health care professionals talk to us about diet is 10 seconds. Did you know that less than 3% of Americans actually eat enough fruits and vegetables, according to the American Heart Association? Chris also spoke about the benefits of fiber, which is only found in whole, plant foods and not in animal foods. Fiber reduces the risk of colon cancer, breast cancer, diabetes, heart disease, and obesity and only 3% of Americans eat the recommended amount of fiber (30-40 gm per day).

Dr. Alan Goldheimer thinks that blood pressure of 90/60 is ideal. What makes our blood pressure rise in the first place? Chris said that he thinks it is the fat. Chris then mentioned a study of vegetarians who started eating meat once per week, had a 146% increased risk of heart disease, 152% increased risk of stroke, 166% increase risk of diabetes, and a 231% increased risk of being overweight.

High blood pressure increases your risk of heart attack, stroke, and congestive heart failure. Blood Pressure of 138/88 increases the risk of heart attack 5 fold compared to a healthier blood pressure of 110/70. Each point reduction in blood pressure reduces all-cause mortality by 1 percent. Chris showed a slide from Dr. Conrad Esselstyn showing a scan demonstrating that a plant based diet can reverse coronary artery disease.

Chris mentioned that the following are his favorite web sites for additional information:

- [www.forksoverknives.com](http://www.forksoverknives.com)
- [www.nutritionfacts.org](http://www.nutritionfacts.org)
- [www.pcrm.org](http://www.pcrm.org)
- [www.drmcDougall.com](http://www.drmcDougall.com)
- [www.nutritionstudies.org](http://www.nutritionstudies.org)
- [www.ornish.com](http://www.ornish.com)
- <https://foodrevolution.org/>
- [www.vegsource.com](http://www.vegsource.com)

Dr. Elkin, a cardiologist, then raised some objections, including that blood pressure of 90/60 is not a particularly good thing, esp. in seniors, since they can pass out and fracture a hip. The ideal blood pressure is 110/70, according to most cardiologists, and most patients arteries get stiffer as they age,

which makes their blood pressure go up. Dr. Elkin also objected to Chris's claim that fat causes blockages in the arteries. The science of fats is an evolving science now and the brain is 65% fat and if you want your brain to age well, you have to feed it fat.

Then Dr. Boros said that a high fat diet reduces glucose and insulin, since fat cannot contribute to net glucose synthesis, since fat can only be oxidized through beta oxidation, so it only contributes 2 net carbons for the PC (Pyruvate Carboxylase) cycle. A high fat diet (ketogenic) actually reduces glucose levels.

Adam Benning mentioned that there are over 7000 studies showing that good fats like omega 3 fats and omega 9 fats like olive oil reduce heart attacks, while omega 6 fats that come from vegetable oils are pro-inflammatory and increase heart disease risk.

I mentioned that the only way we can get the omega 3 fats (EPA and DHA) that our bodies utilize is by consuming fish or fish oil and that if consume omega 3 ALA from vegetable sources like flax, we are only able to convert a small percentage of it to the EPA and DHA, the active forms of omega 3 in our bodies. Chris objected that fish get the omega 3s from algae and there are plenty of omega 3s available from vegetable sources. And fish are not only really good at bio-accumulating omega 3s but they also bio-accumulate toxins, like PCBs and mercury.

## PALEO DIET

Next up was Dr. Howard Elkin, who is a board certified cardiologist and who also uses a Functional medicine approach in his anti-ageing practice. Dr. Elkin will be publishing a book on anti-ageing in 2017. He mentioned that **there is not one diet for everyone**. As a cardiologist, Dr. Elkin said that he deals a lot with complex lipid disorders and that he can't use a vegetarian, high carbohydrate diet on patients who have small, dense LDL particles and high triglycerides and low HDL. But if he has a patient with a type IIA who has high LDL and everything else is good, then they will likely respond very well to a vegetarian diet.

The Paleo diet comes from the diet that our ancestors followed when they lived a hunter gatherer lifestyle. The Paleo diet, like the Mediterranean diet, is also a lifestyle, where we hunted and gathered food during the day and we slept at night. On the other hand, with our modern lifestyles many people are only sleeping 5-6 hours per day. The human genome hasn't really changed that much in 10,000 years. The modern food processing procedures introduced in the Neolithic period is what really led to the chronic diseases that are so common today. Dr. Elkin recommended that everybody read the classic article by Dr. Loren Cordain on the paleo diet: <http://ajcn.nutrition.org/content/81/2/341.long> Loren Cordain sees the Paleo diet as consisting of whole unprocessed foods. Cordain mentions seven things in this paper that distinguish our modern diet from the primitive diet:

1. **Glycemic load**—the modern diet is much higher glycemic due to high intake of refined grains, sugar, and fruit juice and sweetened beverages. The paleo diet has much more protein and fat and fewer starches.
2. **Fatty acid composition**—the modern diet is higher in omega 6 fats than omega 3 fats due to intake of vegetable oils and corn fed animal products and higher in trans fats due to hydrogenated oils
3. **Macronutrient composition**—modern diet higher in carbohydrates and lower in protein than the primitive diet
4. **Micronutrient density**—the modern diet is much lower in micronutrient density, since refined sugar and carbohydrates have displaced much healthier alternatives
5. **Acid-base balance**—the modern diet produces a net acid load due to higher grain intake and lower consumption of fruits and vegetables, which have been replaced by refined carbohydrate products. Dr. Elkin explained that he doesn't agree with this concept since any diet with a lot of animal products will be fairly acidic and he said that our bodies can work fine with a slight acidic load.
6. **Sodium-potassium ratio**—the modern diet is much higher in sodium/salt due to food processing. If a food is found in a box or a bag or a can, it's probably high in salt.
7. **Fiber content**—the modern diet is lower in fiber, since refined grains, sugars, vegetable oils, dairy, and alcohol are devoid of fiber and make up a large part of our diet

Dr. Cordain explains that “A large part of the modern diet consists of dairy products, cereals, refined sugars, refined vegetable oils, and alcohol make up 72.1% of the total daily energy consumed by all people in the United States, these types of foods would have contributed little or none of the energy in the typical pre-agricultural hominin diet.” Therefore, these foods are excluded in the Paleo diet, as are all of the processed foods, such as breakfast cereals, cookies, cakes, breakfast cereals, bagels, rolls, muffins, crackers, chips, pizza, soft drinks, candy, ice cream, condiments, and salad dressings that dominate the typical US diet. I would like to point out that Dr. Cordain argues that the Paleo diet is not high in saturated fat, as generally believed, since wild, grass fed animals have higher levels of omega 3 fats. In addition, while wild animals have fat storage that is largely saturated fat, the dominant fatty acids in muscle and organ meats are polyunsaturated fatty acids (PUFAs) and monounsaturated fatty acids (MUFAs). Further, since these “subcutaneous and abdominal body fat stores are depleted during most of the year in wild animals, PUFAs and MUFAs ordinarily constitute most of the total carcass fat. MUFAs and PUFAs are the dominant fats in the edible carcass of caribou for all 12 mo of the year... Because of the seasonal cyclic depletion of SFAs and enrichment of PUFAs and MUFAs, a year-round dietary intake of high amounts of SFAs would have not been possible for pre-agricultural hominins preying on wild mammals.” **Interestingly, Cordain's view that the Paleo diet is healthy because it does not have a high levels of saturated fat is in contrast to a number other prominent Paleo proponents today, such as Chris Kresser and Nina Techoltz, who argue that eating saturated fat is perfectly healthy and not a contributor to heart disease in most people, provided they avoid the refined carbs.** Even Dr. Mark Hyman has recently argued that saturated fat is not as bad as we thought and not a cause of heart disease as long as you avoid “sweet fat”, the combination of saturated fat eaten with sugar and processed carbohydrates.

Today the main sources of saturated fats are fatty meats, baked goods, cheese, milk, margarine, and butter and the only thing that existed back in cave man days was meat. Other forms of saturated fat, such as from coconuts, are considered good saturated fats. Are some saturated fats good and some bad? There is still a somewhat unsettled controversy today whether saturated fat contributes to heart disease, even if consumed at high levels, and we know now that it is not as bad as once thought. On the other hand, there are a number of studies that show when you replace saturated fats with polyunsaturated or monounsaturated fats, you see a reduction in heart disease, but if you replace saturated fats with carbohydrates, you get more heart disease.

Howard explained that the classic Paleo diet excludes legumes and grains, partially due to the fact that legumes and grains contain phytic acid and lectins, which are sometimes referred to as anti-nutrients and it is argued that they are harmful to our health. Phytic acid may displace important minerals, such as calcium, magnesium, iron, copper, and zinc, however, Howard argued that if it does that, it is only in the GI tract, so some Paleo proponents now think that legumes are healthy to consume as part of a Paleo approach. Likewise, some current Paleo proponents recommend including full fat, raw, unpasteurized dairy.

When we speak about the differences between the Paleo and the Mediterranean diets, Dr. Elkin admitted that the Mediterranean diet has much more research to support it and the studies that have been done on the Paleo diet are smaller and of poorer quality. Howard explained that the **Mediterranean diet is not as nutritionally dense as the paleo diet in vitamins and minerals and contains a higher salt content. The Mediterranean diet has a higher glycemic load because it contains a lot of bread and higher glycemic carbs and there may be less absorbable iron and zinc. The Paleo diet is better for weight loss and for lowering triglycerides.**

Chris McClain asked what about the fact that 80% of antibiotics are fed to animals, how is that not problematic with the paleo diet? And this also contributes to the spread of antibiotic resistant bugs.

## **KETOGENIC DIET**

Our final presenter, Dr. Laslo Boros, a professor of pediatrics at UCLA, presented a fascinating perspective on why eating a Ketogenic diet helps to promote health by depleting deuterium. Approximately one percent of hydrogen molecules are deuterium. Deuterium is also known as heavy hydrogen, since it is a stable isotope of hydrogen and is often listed as H<sub>2</sub>. While hydrogen has a proton and no neutron in its nucleus, deuterium is a hydrogen molecule with both a proton and a neutron in its nucleus. DNA is made up of acid base pairs held together by hydrogen molecules and if these hydrogen molecules are replaced by deuterium, they become less stable and there is an increased risk of cancer or other chronic diseases. Fat has low deuterium, so a high fat, ketogenic diet is preferable to promote health, according to Dr. Boros.

Dr. Boros argued that the mitochondria produces deuterium depleted water if given a ketogenic/high fat diet. Also drinking deuterium depleted water can be beneficial in reducing the deuteration of sugar-phosphates in the DNA backbone, thus possibly protecting against aneuploidy and resisting strand

breaks that can occur during exposure to radiation and chemotherapeutics. Dr. Boros is arguing that cancer risk is correlated to the processed carbohydrate intake in place of natural fat in the modern Western diet that results in excessive deuterium loading. **Following a ketogenic diet and drinking deuterium depleted water will lead to deuterium depletion, which leads to strong hydrogen bonding, which inhibits tumor growth and tumor formation.** Dr. Boros also claims that this is how some of the targeted anti-cancer drugs work, like Avastin and Glivec.

This section is brief, since Dr. Boros would not let me record his presentation. Dr. Boros's talk was fascinating, esp. since none of us had heard anything about deuterium before, though I am personally skeptical anytime someone claims to have found the hidden cause of cancer. However, for those interested in learning more about his theory, there are a number of presentations by Dr. Boros on Youtube, including <https://youtu.be/b3C-luRvvMM> and <https://youtu.be/Qw6ifcT1zGc> Also read his paper that follows.

**I hope to see you all on the 19<sup>th</sup> of January for our next meeting with Miriam Zacharias on marketing a Functional Medicine practice!**