Highlights From a Sabbatical in Nutritional Medicine

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One of the bounties of being a professor is the ability to go on sabbatical. I had the opportunity to spend my final sabbatical in Portland, Oregon at the National College of Natural Medicine (NCNM) in the fall of 2014, where I immersed myself in their whole-foods-based Master of Science in Nutrition (MScN) program.

Over the past few years I have thought deeply about what I want to do after I retire. Originally I had seriously considered becoming certified as a nutritional consultant, but after completing my sabbatical it became clear to me that I could help more people through education than by treating individual clients. With that goal in mind, I want to share information I learned during my sabbatical that I found particularly useful and that I hope will inspire readers to enhance their personal health.

Food-as-medicine has been my passion for many years, and I was eager to spend my sabbatical at the epicenter of this newly emerging discipline. I anticipated an integrated experience that would complement the piecemeal study I had done on my own over the previous nine years, and the reality surpassed my expectations. During my time at NCNM I was privileged to audit eleven courses and attend a Holistic Nutrition Retreat, which revolutionized the teaching of my Nutrition course and how I apply food-as-medicine to my own life. I also made some deep friendships and professional connections that will enable me to continue learning and teaching about this important topic for the rest of my life.

Regarding the course work, I attended Macronutrient and Micronutrient Nutrition and Labs, Nutritional Assessment, and Global Food Systems classes in the Masters curriculum, and a Nutrition II course in the naturopathic medical school. I also took specialty Farm to Table and Detox and Cleanse courses, applied courses in Gluten Free Cooking, Vegan Diets, and Recipe and Menu Development, and a FAME (Food-As-Medicine Everyday) course that provided all the details on how to set up healthy cooking classes in the community. My auditing privileges extended to the semester after I returned to Juniata, when the instructors allowed me to access online information for nine additional courses that included Healing Foods, Medical Nutrition Therapy, Nutritional Supplements, and Therapeutic Diets.

My first revelation happened early in the semester in the Macronutrient class when I learned that Alzheimer's disease is now considered to be type 3 diabetes.[1] Insulin resistance and deficiency, characteristics of the more commonly known types of diabetes, also occur in Alzheimer's disease, making it difficult for the brain to use glucose. This results in impaired energy metabolism, which can lead to inflammation and additional insulin resistance that contribute to the neurological damage characteristic of Alzheimer's. Much is still unknown, but it is clear that this debilitating condition is more complex than originally thought and that diet can play a role in its development and possible treatment.

I also learned some valuable insights about folic acid and magnesium in my Micronutrient course. Folic acid is a synthetic form of the B vitamin folate, which is especially important during early embryonic development to prevent neural tube defects. Women of childbearing age should consume at least 400 micrograms of folic acid daily, and as a public health measure beginning in 1996 the FDA required cereal grain products to be enriched with folic acid.[2] Later, meal replacement products and infant formula followed. Unfortunately, folic acid displaces the active natural forms of folate from folate receptors and folate binding proteins, and the conversion to the active forms is not very efficient. In addition, folic acid can cause problems for people with a common mutation in the MTHFR (methylenetetrahydrofolate reductase) gene that prevents them from producing the enzyme that transforms folic acid into the active form required for normal protein metabolism. Supplements therefore should contain only natural forms of folate, such as L-5-methytetrahydofolate or 5-formyl-tetrahydrofolate (folinic acid).[3] This is an especially critical criterion when choosing prenatal vitamin supplements, most of which currently still use synthetic folic acid.

Magnesium deficiency is widespread in the U.S., with over 60% of adults obtaining less than the EAR (estimated average requirement).[4] When I saw the Figure below in my Micronutrient class I realized why. With the exception of cashews, few people commonly consume the richest sources of magnesium and even if they do, it takes several serving sizes just to get to the RDA. This is a significant problem, as low magnesium levels, particularly when calcium intake is high, contribute to chronic health problems, including type 2 diabetes, hypertension, metabolic syndrome, and colon cancer.[5] That information made it clear to me to add a magnesium supplement to my personal regimen.

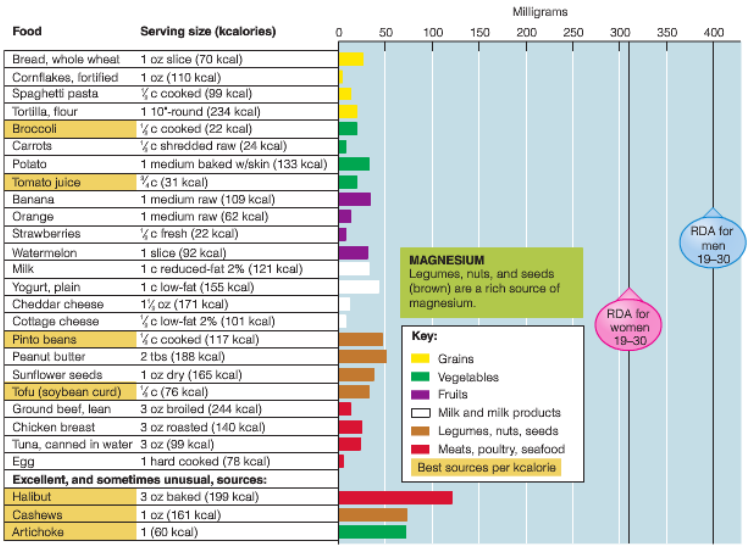


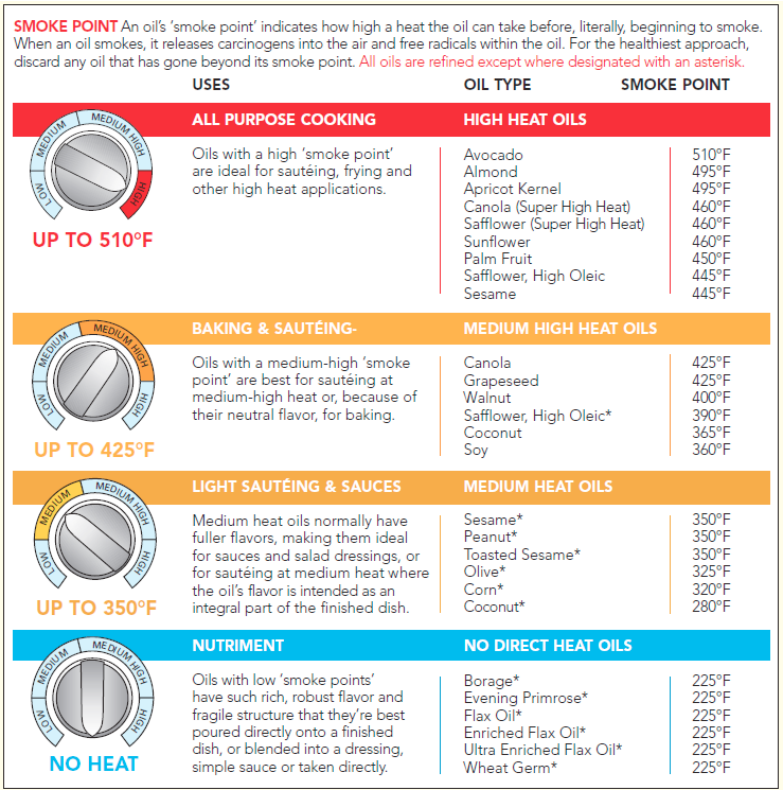
Figure 1. Food sources of magnesium

I also learned about the role of carbohydrates in health and disease. Carbohydrates are at the base of virtually every food pyramid across cultures, and the conventional recommendation in the U.S. is that carbohydrates should constitute 45-65% of the diet. However, a consistent message in the NCNM program was to aim for the lower end of this continuum. In addition, their mantra was to consume "fat, fiber, and protein" when eating carbohydrates to minimize insulin spikes, thereby decreasing the potential for insulin resistance.

Regarding carbohydrates, one of the biggest public health debacles in the history of our country was the recommendation of the American Heart Association to adopt a low fat diet to prevent heart disease, which became national dietary policy in 1977 and is only recently being challenged.[6] This guideline was based on specious research in the 1950s by Ansel Keyes and, ironically, was a primary factor contributing to the epidemic of obesity and cardiovascular disease. Excess carbohydrates, especially simple sugars and refined carbohydrates that most people were substituting for the fat, led to abdominal obesity and an increased risk of both cardiovascular disease and diabetes. Toward this end, an article that came out after I returned from sabbatical confirmed that a low carbohydrate, high fat diet resulted in more weight loss and an increase in insulin sensitivity than a high carbohydrate, low fat diet.[7] It is also important to mention that although statistics cite a decrease in deaths from cardiovascular disease since the 1960s and 70s, they do not explain that this is due to medical intervention in the face of rising incidence.[8]

As for fats, it is not only important to eat healthy fats but to use them properly during cooking to avoid producing carcinogens and free radicals that contribute to aging and degenerative diseases. One

way to know if a fat is no longer healthy is if it begins to smoke during the cooking process. Figure 2, which was shared in a lecture in my Macronutrient class, is a handy guide for which oils to use for different cooking purposes.



SMOKE POINT An oil's 'smoke point' indicates how high a heat the oil can take before, literally, beginning to smoke. When an oil smokes, it releases carcinogens into the air and free radicals within the oil. For the healthiest approach, discard any oil that has gone beyond its smoke point. All oils are refined except where designated with an asterisk.

USES		OIL TYPE	SMOKE POINT
UP TO 510°F	**ALL PURPOSE COOKING**	**HIGH HEAT OILS**	
	Oils with a high 'smoke point' are ideal for sautéing, frying and other high heat applications.	Avocado	510°F
		Almond	495°F
		Apricot Kernel	495°F
		Canola (Super High Heat)	460°F
		Safflower (Super High Heat)	460°F
		Sunflower	460°F
		Palm Fruit	450°F
		Safflower, High Oleic	445°F
		Sesame	445°F
UP TO 425°F	**BAKING & SAUTÉING-**	**MEDIUM HIGH HEAT OILS**	
	Oils with a medium-high 'smoke point' are best for sautéing at medium-high heat or, because of their neutral flavor, for baking.	Canola	425°F
		Grapeseed	425°F
		Walnut	400°F
		Safflower, High Oleic*	390°F
		Coconut	365°F
		Soy	360°F
UP TO 350°F	**LIGHT SAUTÉING & SAUCES**	**MEDIUM HEAT OILS**	
	Medium heat oils normally have fuller flavors, making them ideal for sauces and salad dressings, or for sautéing at medium heat where the oil's flavor is intended as an integral part of the finished dish.	Sesame*	350°F
		Peanut*	350°F
		Toasted Sesame*	350°F
		Olive*	325°F
		Corn*	320°F
		Coconut*	280°F
NO HEAT	**NUTRIMENT**	**NO DIRECT HEAT OILS**	
	Oils with low 'smoke points' have such rich, robust flavor and fragile structure that they're best poured directly onto a finished dish, or blended into a dressing, simple sauce or taken directly.	Borage*	225°F
		Evening Primrose*	225°F
		Flax Oil*	225°F
		Enriched Flax Oil*	225°F
		Ultra Enriched Flax Oil*	225°F
		Wheat Germ*	225°F

Figure 2. Smoke Points of Oils

A fact that stood out for me from my Gluten Free Cooking class is the role of gliadin proteins in a condition called leaky gut. Gliadin is one class of proteins (the other is glutenin) in gluten-containing grains like wheat, spelt, barley, triticale, and rye that produce gluten when mixed with water.[9] The wall of the small intestine is one cell thick, with individual cells connected by tight junctions that prevent undigested food molecules from entering the bloodstream. If the tight junctions become compromised in a condition known as leaky gut, undigested food molecules can go between the cells directly into the bloodstream, where they can trigger allergies and every autoimmune disease there is.[10] The gliadin component of gluten causes the intestinal wall to release zonulin, a protein that loosens the tight junctions. This occurs to some extent in everyone but is more pronounced in people with the genetic constitution for celiac disease.[11] If the tight junctions are seriously compromised, leaky gut results.

Gluten makes bread dough more elastic and enhances rising, which is why it is prized by bakers and often added to breads as a separate ingredient. Since bread is a staple of the standard American diet and since most people purchase their bread, gliadin exposure in the standard American diet is significant.

This may be a factor in the widespread occurrence of celiac disease and a related condition known as gluten sensitivity. Regarding gluten sensitivity, it was disturbing to learn that glyphosate, the active ingredient in Roundup that is often sprayed on wheat before harvesting to enhance the drying process, can trigger virtually every symptom of celiac disease.[12] With this in mind, I routinely make my own bread with organic flour to minimize my chances of developing leaky gut.

Although there is no "one size fits all" diet, there are some general guidelines. Drs. Julie Briley and Courtney Jackson from NCNM developed a Food-As-Medicine plate, which I feel is a very comprehensive and useful summary for optimal health in most people. Half the plate consists of non-starchy vegetables and the other half consists of a little over 1/3 each of protein and gluten free grains/root vegetables, with the remainder as healthy fats like avocados, nuts, and coconut. On the side is water as the beverage and fruit as the dessert.

To summarize, the final sabbatical of my career has been one of the most rewarding experiences in my life. It was a "dream-come-true" experience for me personally and professionally, and I am incredibly grateful for having had this precious opportunity. It also has served as a springboard for lifelong learning about nutritional medicine and inspired me to do my part in helping to transform our disease care system into a true health care system.

NOTES

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