Does it Matter What I Eat?

Between 1935-1948, Harvard-trained neurologist, Dr. Roy Swank, collected information about the development of MS throughout Norway. He noticed high levels inland, in the farming and dairying districts, and very low levels in the coastal fishing villages. When he analyzed the data, he found that butterfat was associated with MS and fish consumption was protective against the disease. The results of his research were a turning point in MS research, his publication, in the *New England Journal of Medicine* in 1952, was the first to suggest an association between diet and MS.

Since 1952, several more studies have attempted to determine if there is an association between nutrition and MS, and if so, how can patients use this information to their advantage. While not all studies agree, some themes have emerged over the past 50 years:

- **Increased Risk of MS**
  - Dairy: Milk, butter, dairy fat
  - Meat: beef, pork
  - Fat: Animal fat, saturated fat, total fat
  - Low-fish diets

Naturally, seeing this list prompts many questions for patients. If this is true, why haven’t my other doctors told me about this? If I start eating with respect to the above list, will my symptoms improve? Will I slow the progression of the disease? Did my diet *cause* the disease? Does the diet have to be 100%?

Unfortunately, none of the above questions are easy to answer. Most of the research that has been done has been epidemiological- researchers compare those who get the disease with those who don’t and look for differences. In other words, they look backwards at a disease already underway. Very few studies have been done to answer the question, “Will eating a diet high in fish and low in dairy, fat, beef and pork change the progression of my disease?”

Until more definitive answers are available, it seems reasonable to begin incorporating some, or all, of these dietary changes into one’s lifestyle. After all, the diet above is also associated with a decreased risk of cardiovascular disease, arthritis, obesity, autoimmune disease, and cancer!
Vitamin D, MS, and the Pacific Northwest

It has long been known that individuals living close to the equator are at reduced risk of developing MS. This is also true for individuals at higher altitudes living in the same general area. It seems that being close to the sun offers some protection against MS. At least one explanation for this is that ultraviolet light (UVB) is necessary in the production of vitamin D, a hormone required for healthy immune function.

The Pacific NW has the highest incidence of MS in the U.S. While there may be several contributing explanations, one is certainly the weather.

There is cloud cover for most of the year, which reduces the amount of UV light by 50%. The constant drizzle and cool temperatures encourage us to cover most of our bodies, further sheltering the skin from exposure to the sun. Our urban lifestyle of office jobs, car commuting, and drive-through services prevent even further exposure.

Who is at risk for Vitamin D deficiency?

There is clear evidence that the majority of MS patients exhibit long-term vitamin D deficiency. Blood levels in patients with MS tend to be low even in the summer months, when most people’s levels return to normal. MS patients have significantly reduced bone mass, suggestive of vitamin D malnutrition. One study found MS patients lost bone mass at a 3- to 7-fold higher rate and experienced fractures at a 10-fold higher rate than their peers. (Cosman, 1998; Hayes, 2000)

- **Limited sun exposure:** spend most of your time indoors, skin is not commonly exposed while outdoors, live far from the equator (northern US), live in areas with significant cloud cover (reduces UV rays), and those exposed to industrial pollution, which further blocks UV rays (Lancet 2003;362:1289)

- **Steroid use:** corticosteroids used to reduce inflammation impair vitamin D metabolism and increase one’s risk of bone loss.

- **Limited dietary consumption:** vitamin D is found naturally in oily fish (cod liver oil, salmon, mackerel, tuna, sardines) and in fortified foods (cow milk, soy milk, some cereals)

- **Strict vegans:** the foods known to naturally contain vitamin D are of animal origin (primarily fish). Most supplements and supplemented foods use a form of vitamin D sourced from lanolin (sheep’s wool), which some individuals refuse to consume.
Testing for Vitamin D Deficiency (& Toxicity)

The best way to assess vitamin D levels is to have your doctor measure your level of 25-hydroxycholecalciferol, otherwise known as 25-OH vit D, in your blood. The test costs approximately $175 and is covered by most insurance companies.

It is generally recommended to test vitamin D levels in the winter, when levels are the lowest. However, some research suggests individuals with MS remain deficient throughout the summer months.

Adults living or working in sunny environments where MS prevalence is lowest have circulating levels between 105 and 163 nmol/l (Vieth, 1999). While the blood level necessary for strong bones is about 35-50 nmol/l, it has been suggested the level necessary to prevent MS is around 100 nmol/l!

Regular bloodwork is also important in screening for vitamin D toxicity. Although this is a rare side effect, occurring only at very high doses (>40,000IU/day), it is important to check blood calcium levels regularly. Elevated blood calcium is the earliest sign of vitamin D toxicity.

Supplementing with Vitamin D

All vertebrates, including humans, obtain their vitamin D mainly from exposure of their skin to sunlight rather than from diet.

- Can I get vitamin D from a tanning booth?

Unfortunately, very little. Tanning booths typically filter their rays so they are almost exclusively UVA, the rays that don’t burn but provide a nice, golden tan. It is the UVB light that forms vitamin D.

- What form of Vitamin D should I take- D2 or D3?

Vitamin D3, cholecalciferol, is absorbed significantly more efficiently than D2. Whereas D2 comes from plants, D3 is sourced from lanolin (sheep’s wool). Some individuals are opposed to using D3 sourced from animals, making adequate supplementation much more complicated.

- What dose of vitamin D is necessary to prevent MS?

Nobody knows for sure, but based on the blood levels of those who live in sunny areas with a low incidence of MS, blood levels of ~100 nmol/l may be optimal. Approximately 4000 IU/day is required to achieve this level in individuals not regularly exposed to the sun (Hayes, 2000).

- What about vitamin D toxicity?

Very high doses of vitamin D can cause high blood calcium levels, which could potentially be fatal. All documented cases of vitamin D toxicity with high blood calcium involved intakes above 40,000 IU/day. (Vieth, 1999)
So What Should I Eat?

Experts from the Harvard School of Public Health created the Healthy Eating Pyramid based on the best available scientific evidence about the links between diet and health (see below). This pyramid is based *solely* on research and has had no influence by lobbying groups or political organizations. The Healthy Eating Pyramid below is not intended to be a diet specifically for individuals with MS, but is designed to be a general recommendation for anybody wishing to prevent disease. It happens to be an ideal diet for anyone with MS.

Tips for Satiety

The Standard America Diet (SAD) is full of fatty foods—fried foods, creams, fatty meats, etc. and breads and pastas that take up a bunch of space, but offer little nutritional value. When individuals begin eating healthier, one of the most common comments is that they don’t feel full. Your stomach will learn to adjust after a couple weeks as you get used to new foods.

Our bodies register, “I’ve had enough” when there enough fats reach circulation. One way to avoid a sense of hunger is to fill your diet with *healthy fats and oils*—nut butters, avacado, coconut milk, cocoa, plant oils (olive oil, sunflower oil, etc.), and oily fish.
Vitamin B12

Vitamin B12 is a common nutrient deficiency and this may be especially important for individuals with multiple sclerosis. Some studies suggest individuals with MS may be lower in B12 than those without MS.

Vitamin B12 deficiency and multiple sclerosis are virtually identical in their symptoms and look the same on MRI, making it difficult to tell them apart. For this reason, it is important to ensure that your levels are adequate.

Vitamin B12 is important for immune system regulation, for the formation of new myelin (following destruction), and high dose B12 has antiviral activity.

Unfortunately, vitamin B12 is not easily absorbed in the gut. To ensure adequate absorption of supplemental vitamin B12, one must take it as a sublingual (dissolved under the tongue) or intramuscular injection. While the shot needs to be prescribed by a physician, the sublingual form is readily available from most health food stores.

Each individual’s requirement for the nutrient is different. Because there are no symptoms of vitamin B12 toxicity, and individuals with MS may have higher requirements (due to the increased need to repair myelin and fight infection), blood levels should be in the high-normal range.

Food as Nutrition

The Journal of Agricultural and Food Chemistry reported an analysis of the nutrient content of food in 2003. The results of the study were shocking!

Over the last 50 years the potato has lost:
- 100% of its vitamin A
- 57% of its vitamin C and iron
- 28% of its calcium
- 50% of its riboflavin
- 18% of its thiamine

The results were similar for all the 25 fruits and vegetables tested. One of the worst results was from broccoli in which ALL nutrients had declined measurably!

The above statistics are pertinent for those eating fruits and vegetables. If your diet is low in whole foods, and high in processed foods, fast food, and preserved foods, you are even more likely to be nutritionally depleted.

To make matters worse, many in the US are hungry. Approximately 35.1 million people in the US live in households considered where food is scarce or unavailable. (www.frac.org)
What about Dairy?

We’ve all been told so many times that dairy is ‘good’ it’s hard to think of this food in any other context. Once you start paying attention, you realize a rare day goes by without including dairy in some form or another - butter, cheese, milk, cream, yogurt, sour cream, cottage cheese, and ice cream to name a few!

Dairy has come up repeatedly in the research as being associated with an increased risk of MS. Some researchers think it is because of the fat content of dairy (butter, cream, milk are more associated than yogurt or cheese). Other research suggests that it has nothing to do with the fat content, but is instead associated with an allergic cross-reaction between a milk protein and the myelin.

Food Allergies

Many individuals have heard that food allergies, such as wheat sensitivity (celiac disease), are somehow related to MS. Generally speaking, this is not true. What is true is this: Food allergies take many different forms and in some people, food allergies manifest with symptoms very similar to MS. Severe neurological symptoms are not common consequences of food allergies.

That said, if you have food allergies, it is wise to avoid those foods that trigger immune system overreaction. Your doctor can test for IgE and IgG food allergies with a simple blood draw. The test costs about $175 and is often covered by insurance.

Individuals with MS should not assume their symptoms are due to food allergies and restrict their diet any more than is necessary.

Fish- Balancing Good Fats with High Mercury

These days it seems like there is a problem with all foods! On one hand, fish is praised as a good source of protein and healthy essential omega-3 oils; on the other hand we hear warning after warning to avoid fish because of high levels of mercury, PCBs, and other toxicants!

It is necessary for everyone, not just individuals with MS, to be aware of hidden sources of mercury in our diets. (Symptoms of mercury toxicity are almost identical to MS, and likely to be dismissed as part of the disease.) We do not know whether individuals with MS have nervous systems that may be more vulnerable to the toxicities of mercury. Until some of these questions are answered, it is prudent to know your fish, know where it comes from, and avoid those fish known to have high levels of mercury.
Fish High in Omega-3s & Low in Mercury

<table>
<thead>
<tr>
<th>Omega-3 Level Grams n-3/3 oz serving</th>
<th>FISH</th>
<th>Mercury Level (PPM) Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.17-1.81</td>
<td>Herring (Pacific, Atlantic)</td>
<td>0.04</td>
</tr>
<tr>
<td>0.98-1.7</td>
<td>Sardines</td>
<td>0.02</td>
</tr>
<tr>
<td>1.4</td>
<td>Anchovies</td>
<td>0.04</td>
</tr>
<tr>
<td>0.9-1.48</td>
<td>Salmon (all kinds)</td>
<td>0.0-0.01</td>
</tr>
<tr>
<td>1.17</td>
<td>Oyster (Pacific)</td>
<td>None detected</td>
</tr>
<tr>
<td>0.84-0.98</td>
<td>Trout, Rainbow</td>
<td>0.03</td>
</tr>
<tr>
<td>0.34-1.57</td>
<td>Mackerel</td>
<td>0.05-0.09</td>
</tr>
<tr>
<td>0.42</td>
<td>Flounder/ Sole</td>
<td>0.05</td>
</tr>
<tr>
<td>0.35</td>
<td>Crab, Alaskan King</td>
<td>0.06</td>
</tr>
<tr>
<td>0.13-0.24</td>
<td>Cod</td>
<td>0.11</td>
</tr>
<tr>
<td>0.26-0.73</td>
<td>Tuna, canned</td>
<td>0.12</td>
</tr>
<tr>
<td>0.98-1.7</td>
<td>Tuna, fresh</td>
<td>0.38</td>
</tr>
</tbody>
</table>

**REFERENCES:**
http://www.cfsan.fda.gov/~frf/sea-mehg.html
U.S. Department of Health and Human Services and U.S. Environmental Protection Agency: Mercury Levels in Commercial Fish and Shellfish
www.nalusa.gov/fnic/foodcomp/
U.S. Department of Agriculture Nutrient Data Laboratory

**Fish High in Omega-3s & Low in Mercury**

While fish is not the only source of dietary omega-3 fatty acids, it is one of the better sources because of its very high level of good fats. The “good fats” in fish consist mostly of EPA and DHA- in addition to having natural anti-inflammatory properties, these are the fats that make up much of the brain and myelin sheath.

Unfortunately, our waters have become irreparably polluted with mercury, a neurotoxin individuals with MS may be especially sensitive to. It is therefore important to diversify the sources of omega-3 fats, including plant omega-3’s as well.

**Plant sources of omega-3 fats:**
- Flax seeds, flax seed oil
- Canola Oil
- Soybean Oil
- Walnut Oil
“Chips & Salsa Vegetarians”

In practice I see a lot of individuals who become familiar with vegetarian diets somewhere along the way, they liked what they heard, and jumped right in. They eliminate meat and dairy from their diets and eat only what’s left - I call these “chips & salsa vegetarians.” Their education as to how to eat vegetarian stopped at what to cut out, nobody taught them what to add in! While the “MS diet” outlined here is not technically a vegetarian diet, the same pitfalls apply.

There are hundreds of good reasons to avoid the excessive consumption of animal products. That said, there are also some very good reasons to consume them. I cannot stress enough the importance of working with a nutritionist to ensure adequate consumption of protein, iron, cholesterol, losses from fortification, etc.

Additionally, vegetarian foods are typically easier to digest and people learning how to eat a reduced-meat diet complain they don’t feel satiated. Some tricks for increasing the satiety (sense you’ve had enough to eat) of a meal are to increase the content of healthy fat (olive oil, sunflower oil), plant fats (coconut oil, nut butters), and fiber. A nutritionist can help with all of this.

About The Author

Laurie Mischley, ND is a naturopathic doctor in Seattle's University District. Her undergraduate education was at Pennsylvania State University, where she received a B.S. in Nutrition Science and completed her pre-medicine coursework. It was during this time that she became aware of the dynamic relationship between the environment and the body. Her passion and intellectual curiosity for nutritional medicine grew, leading her towards a career in naturopathic medicine, a branch of medicine that believes strongly in prevention and the preferential use of non-invasive therapies. She graduated from Bastyr University, the nation's most science-based natural medicine program, in 2001, with a Doctorate of Naturopathy.

Dr. Mischley's practice is devoted to individuals with neurological and/ or mental health conditions. She enjoys working closely with neurologists and psychiatrists, and believes the patient is best served when they have a 'team' of competent providers with varying philosophies. In practice, she emphasizes patient education and autonomy. It is her belief that the symptoms of multiple sclerosis are cause by many different factors, and for this reason each patient should be treated individually. Loyal to the scientific process, she stays abreast of the literature and it's relevance to her patients. She provides counsel on the role of diet, supplements, and lifestyle in preventing, slowing, and reversing disease processes.