

Multiple Sclerosis and Food Proteins

By Ashton Embry

The basic disease process of MS involves the activation of autoaggressive, myelin-sensitive, immune cells that subsequently lead an autoimmune attack on myelin in the central nervous system. This leads to myelin and nerve axon destruction and the occurrence of the many disabilities that characterize MS. The myelin-sensitive immune cells are activated by fragments of foreign proteins which closely resemble fragments of myelin proteins (“molecular mimicry”). The two obvious sources of foreign proteins are infectious agents and foods. There is little doubt that infectious agents are involved in MS but it is less known that there is substantial evidence that implicate food proteins in MS and other closely related autoimmune diseases.

This article summarizes the scientific evidence that suggests various food proteins may be playing a role in the activation of the autoaggressive immune cells. If this is indeed happening, then avoidance of those food proteins might well help to decrease the activation of myelin-sensitive immune cells and thus be of benefit for controlling MS.

Substantial scientific evidence points to proteins derived from dairy products as being involved in the MS disease process. An epidemiological study showed a very close correlation between the prevalence of MS in a country and the amount of milk consumed in that country. Subsequent immunological studies demonstrated that protein fragments from milk closely resemble parts of proteins associated with myelin. It was further demonstrated that these “mimicking” milk proteins can activate autoaggressive immune cells that are sensitive to myelin and that persons with MS carry much higher amounts of milk-sensitive T cells than do healthy controls. As a final part of this study, the researchers showed that injection of the milk protein into laboratory animals caused EAE, a disease which closely resembles MS. Thus it appears that milk proteins have the potential to activate autoaggressive immune cells that attack myelin. In another, yet to be published study, a researcher demonstrated that mice fed a diet with no proteins did not develop EAE despite being primed to do so. When milk was added to the diet of the mice, they developed EAE. It is also worth noting that diverse research including small clinical trials has implicated milk in closely related autoimmune diseases such as type 1 diabetes, rheumatoid arthritis and Crohn’s.

Other sources of potentially problematic proteins are the grains wheat, rye and barley, all of which contain gluten, a complex mix of proteins. Gluten has been identified as the cause of two autoimmune diseases, celiac disease and dermatitis herpetiformis. It has also been implicated in neurological diseases including one called gluten ataxia. This establishes beyond a doubt that food proteins can play a substantial role in the onset and progression of autoimmune disease. The evidence linking gluten to MS is not strong. It has been noted that areas of high rates of MS coincide with areas of major gluten grain cultivation and consumption. An animal study found that mice on a gluten free diet had much less disability than those on a regular diet after EAE was induced. No studies have been done on determining if proteins in gluten grains are “molecular mimics” of myelin proteins so this question is still open. However it has been established that protein fragments from gluten grains closely resemble parts of self-proteins in the joints and pancreas. These grain-derived proteins can activate autoaggressive immune cells that are part of the disease process in rheumatoid arthritis or type 1 diabetes. Avoidance of gluten has been found to reduce symptoms in rheumatoid arthritis and Crohn’s. Another relevant study demonstrated that adding gluten to the diet of genetically susceptible mice caused the mice to develop type 1 diabetes.

The last food type that is suspected of contributing to autoimmune diseases such as MS, rheumatoid arthritis and type 1 diabetes is legumes (beans). Like gluten, legumes have been found to yield protein fragments that closely resemble self-proteins in the pancreas and in joints. Soy, a commonly consumed legume, can cause genetically susceptible mice to develop type 1 diabetes. No epidemiological or immunological studies have been done for legumes and MS.

In summary, dairy products, gluten grains and legumes have all been implicated in MS and/or closely related autoimmune diseases. Notably these food types are some of the most allergenic foods and this further demonstrates a general lack of compatibility between these food types and the human immune system. Such a lack of compatibility with the human genome is best explained by the fact that these foods have been added to the human diet relatively recently, during the agriculture revolution over the last 10,000 years. This may seem like a long time but it is extremely short when compared with four million years of human evolution. It is postulated that humans have not had sufficient time to adapt to such foods and that part of the population still carries genes that result in immune problems caused by these food types. Autoimmune reactions may well be one of the immune problems associated with these food types as evidenced by the data discussed above.

Many people with MS are choosing to avoid eating dairy products, gluten grains and legumes because they do not want to take the chance that such foods might be activating myelin-sensitive immune cells. Such a substantial change in dietary habits can be accommodated with a few strategies. Dairy products are the main source of calcium for many people and thus, if dairy products are not eaten, a calcium supplement of 1000 mg is essential. Rice products such as rice breads and pastas can readily be substituted for gluten grain products. Legumes tend to be a minor component of most people's diet and increased vegetable intake readily compensates for any nutritional losses associated with legume avoidance.

Clearly at this stage of scientific knowledge we do not know for sure if milk products, gluten grains and legumes are contributing to the MS disease process by activating autoaggressive immune cells. All we can say is that there is a reasonable chance that they are. Each person with MS has to weigh the scientific evidence and decide whether or not to take a chance and eat such foods or to play it safe and avoid them until science decides the issue.